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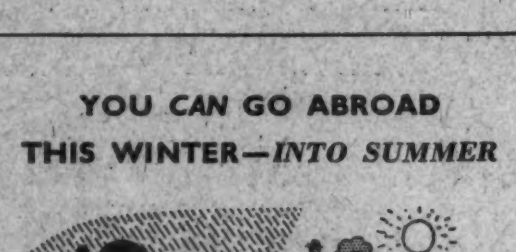

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BRITISH MEDICAL JOURNAL

LONDON SATURDAY NOVEMBER 29 1947

THE VALUE OF B.C.G. VACCINATION IN CONTROL OF TUBERCULOSIS*

BY

G. S. WILSON, M.D., F.R.C.P., D.P.H.

Director of the Public Health Laboratory Service (Medical Research Council)

Vaccination with B.C.G. is now so universally applauded that any attempt to question its value is regarded almost as heresy. Despite this I propose in this address to act as Devil's advocate, and to ask seriously whether the claims of Calmette and Guérin to canonization rest on an unshakable foundation. So far, B.C.G. vaccination has not been used in Great Britain, but there is an increasing demand from tuberculosis workers for its introduction. Before this step is taken let us be sure that it is fully justified. It is much easier to introduce a given measure into the public health practice of this country than to remove it once it has become firmly established. On a more suitable occasion I may dilate on what I call " public health anachronisms "—practices that are carried on now because they have been in use for the last thirty years or so, even though it has since been shown that they are of little or no value for the purpose for which they were originally intended. The accumulated weight of precedent is almost overpowering, and I therefore ask you to pause for a moment before committing yourselves to a practice that it may be very difficult subsequently to discontinue.

Let me make it clear that I have no prejudice either in favour of or against B.C.G. vaccination. I am merely interested in learning the truth about it. The published evidence, however, that I shall review briefly leads me to the conclusion that, though a strong presumptive case may be made out for the value of B.C.G., it is not yet convincing enough to justify the whole-hearted acceptance of this agent as a means of preventing tuberculosis in Great Britain.

Vaccination of Infants with B.C.G.

Of the numerous investigations reported on the vaccination of infants with B.C.G. the majority have included no control group. Attempts to assess the value of the procedure have been made by comparing the tuberculosis death rate among the vaccinated infants with that among the infant population as a whole, either during the same period or during the previous five years or so, or with a group of ostensibly similar infants which have not been offered vaccination. Calmette (1928), for example, vaccinated one group of infants and compared the mortality among them with that among children of tuberculous parents and other children who were exposed to massive infection in their first year of life. As Greenwood (1928), however, pointed out, there were gross fallacies in these figures, and the comparison that Calmette made between the mortality in the vaccinated infants and that in the non-vaccinated was quite unjustifiable.

Wallgren (1934), working at Gothenburg, vaccinated every infant that was considered by the municipal dispensary to be in danger of infection from family contact. The result was striking. The infantile tuberculosis death rate fell from 3.9 per 1,000 in 1927, the year before this routine was introduced, to 0.3 per 1,000 in 1933—a fall of 92%. But, as Wallgren is the first to point out, it is impossible to assess the part played by B.C.G. in this achievement. The infants, for example, were separated from their parents for a variable period of time after vaccination, and in some instances were not exposed to infection till they were a year old. Moreover, the educational work of the dispensary nurses stimulated the interest of the mothers, so that they co-operated in shielding their infants from infection and made full use of the prophylactic means at their disposal. The ensuing fall of 92% in the infant mortality rate due to tuberculosis was almost certainly greater than any fall that might otherwise have occurred during the years 1928 to 1933. It is fairly safe to conclude, therefore, that the very thorough measures taken by Wallgren were mainly responsible for the result observed, but it is quite impossible to say what part in this result was played by B.C.G.

Chicago Investigation

Two lots of workers have included a special control group in their series. At Chicago, Rosenthal, Blahd, and Leslie (1945) carried out an investigation at the Cook County Hospital. Expectant mothers desiring vaccination for their babies were asked to sign a consent card. *X*-ray studies were then made of the entire household to find out whether any of the members was suffering from tuberculosis. The child of every alternate mother who had consented was vaccinated with B.C.G. by the multiple-puncture method, usually when it was three to seven days old. The children were kept under observation and were tuberculin-tested and *x*-rayed at intervals.

The infants were divided into those having no contact with known cases of tuberculosis and those known to be exposed to contact. In the non-contact group 1,204 vaccinated children were observed and 1,213 control children. Among the former there were three cases of tuberculosis and one death, among the latter 23 cases and four deaths. In the contact group, infants who were in contact with closed cases of tuberculosis were removed from their homes for six weeks to three months ; those who were in contact with open cases were permanently removed and kept in a foster-home. Among 98 newborn infants who were in contact with tuberculosis after vaccination there was one case of tuberculosis and no death ; among 63 controls there were four cases and three deaths. Taking the

*A paper read at the International Conference of Physicians on Sept. 12.

contact and non-contact groups together, we see that there were four cases and one death in the vaccinated group as opposed to 27 cases and 7 deaths in the control group (Table I).

TABLE I.—*B.C.G. Vaccination of Infants in Chicago (Rosenthal, Blahd, and Leslie, 1945)*

Group	Subgroup	No. of Children	No. of Cases of Tb.	No. of Deaths from Tb.
Non-contact ..	Vaccinated	1,204	3	1
	Control	1,213	23	4
Contact ..	Vaccinated	98	1	0
	Control	63	4	3
Contact and non-contact together	Vaccinated	1,302	4	1
	Control	1,276	27	7

Superficially these results are impressive, but before accepting them at their face value one would like to have information on a number of points that are left vague. (*a*) The follow-up apparently did not start till three to seven months after vaccination, by which time it would seem that many infants in both groups had died ; it would be interesting to know more about these infants, since they are completely ignored in the final figures ; (*b*) the total deaths from all causes were 21 in the vaccinated and 21 in the control group, but, apart from those due to tuberculosis after the follow-up had started, there is no information on when they occurred or what they were due to ; (*c*) it is said that observations were made on the non-contact group during a period of seven years and on the contact group during a period of three to four years, but it is not stated what was the average duration of observation among the vaccinated and the control groups ; (*d*) there is no information on whether the radiologist who read the *x*-ray photographs knew whether the child had been vaccinated or not ; (*e*) in the early part of the investigation on the contact group there were no controls ; the vaccinated children during this period, however, are included in the comparison ; (*f*) it is not clear whether in the contact cases the controls were isolated in exactly the same way and for the same length of time as the vaccinated.

The results of this investigation suggest that B.C.G. vaccination may lead to some lowering in the morbidity and the mortality rates in infants, but without more precise information on the method of conducting the investigation it would be unwise to regard this as more than a very tentative conclusion.

New York City Investigation

In New York City a more or less similar investigation was carried out, with results that are both interesting and illuminating. Observations were made on children in tuberculous families. Practically all children came under observation before they were a year old, and no child over one month old was accepted unless it was both tuberculin and *x*-ray negative. Except during the first two years of the trial, when the vaccine was given by mouth, all inoculations were made intracutaneously. After January, 1933, the B.C.G. dose was standardized at 0.15 mg. Between 1926 and 1932 the children were divided into two groups, according to whether the mother wished her baby to be vaccinated or not. Under these conditions the children of the more intelligent and co-operative parents tended to be vaccinated and those of the careless and less intelligent parents to constitute the control group. From 1933 onwards the mode of allocation into groups was altered. Consecutive mothers were asked whether they would like to have their children vaccinated. Those that refused were not considered any further. To the children of the mothers who were willing to accept vaccination B.C.G. was given alternately without selection. Under these conditions both the vaccinated and the control groups comprised children who came from the same class of co-operative parents. The results of this investigation, as described by Levine and Sackett (1946), are given in Table II.

TABLE II.—*B.C.G. Vaccination of Infants in New York City (Levine and Sackett, 1946)*

Period	Alternate Selection	Vaccinated Group			Control Group		
		No. of Children	No. of Deaths from Tb.	Tb. Mortality %	No. of Children	No. of Deaths from Tb.	Tb. Mortality %
1926–32	No	445	3	0·67	545	18	3·30
1933–44	Yes	566	8	1·41	528	8	1·52

It will be observed that during the first period, when the method of selection was faulty, the tuberculosis mortality in the control group was five times that in the vaccinated group ; but during the second period, when strict alternate selection was practised, the tuberculosis mortality in the two groups was almost identical.

These results serve to show how important it is, when carrying out a controlled investigation on human subjects, to do everything possible to ensure that the vaccinated and the control children are similar in every respect, including such factors as age, race, sex, social, economic, and housing conditions, intellectual level and co-operativeness of the parents, risk of exposure to infection, attendance at infant welfare or other clinics, and treatment when ill.

Levine and Sackett's findings are open to criticism on three points. First, no records are given of the morbidity, as opposed to the mortality, in the two groups. Secondly, the diagnosis of tuberculosis in 3 of the 11 fatal cases in the B.C.G. group was doubtful. It may be pointed out, however, that only one of these occurred in the 1933–44 period, so that even if this case was excluded it would not have much effect on the final results. Moreover, a similar deduction might have to be made for unconfirmed diagnoses in the control group, though the number of such cases is not stated. Thirdly, the most serious criticism is that the infants were not usually separated from their tuberculous parents before and after vaccination, with the result that some infants may have been actually infected before they were vaccinated and others may have been exposed to infection before immunity following vaccination had had time to develop. It is difficult, as the authors themselves admit, to know how much allowance to make for this factor. Any attempt to make such allowance would be largely guesswork. It is probably safer to conclude that, though B.C.G. vaccination of the infants of tuberculous parents might be of value if accompanied by the necessary amount of segregation to ensure that exposure to infection did not take place till immunity, as judged by the tuberculin test, had been established, under ordinary conditions in which the infants are brought up in a tuberculous environment it seems to confer little, if any, protection.

The results of this investigation do not support those of the Chicago experiment, and we are therefore left without any convincing evidence that B.C.G. vaccination of infants by itself confers any considerable degree of protection against the risk of death from tuberculosis in early life.

Vaccination of Nurses with B.C.G.

The two main investigations on the B.C.G. vaccination of nurses are those of Heimbeck (1936) in Norway and of Ferguson in Canada (1946). Since Ferguson included no control group in his series, and merely judged the efficacy of the B.C.G. vaccination by a diminution in the tuberculosis morbidity of nurses during the investigation in

relation to that in nurses during the previous 5-year period, his results, however suggestive, cannot be accepted without question. It is impossible to be certain that the conditions during the period of the investigation were identical with those before vaccination was started, and conclusions drawn from comparisons of this sort are liable to be misleading.

Of Heimbeck it is probably true to say that he has done more than any other single person to convince tuberculosis workers of the value of B.C.G. vaccination in protecting against the disease in young adults. His conclusions are based on two main contentions : (*a*) that tuberculin-negative nurses are more liable than tuberculin-positive nurses to contract tuberculosis ; and (*b*) that among tuberculin-negative nurses vaccinated with B.C.G. the tuberculosis morbidity is lower in those who become tuberculin-positive as the result of vaccination than in those who do not.

Heimbeck's work was carried out on probationer nurses entering the Ullevål Communal Hospital at Oslo during the years 1924 to 1935. Every nurse was submitted to a von Pirquet test on entry. This was repeated periodically on those that failed to react. From 1927 onwards the negative reactors were vaccinated subcutaneously with B.C.G. As a result rather over two-thirds became von Pirquet positive. The two groups were followed up for two to three years, and the number of cases of tuberculosis developing was noted. The results given in Table III are restricted to cases of pulmonary tuberculosis, the multiple minor manifestations, including erythema nodosum, being omitted.

TABLE III.—*B.C.G. Vaccination of Nurses in Oslo (Heimbeck, 1936)*

Group	Subgroup	No. of Nurses	Nurse Observation Years	No. of P.T. Cases	Rate per 1,000 Observn. Years
von Pirquet positive on entry	(*a*)	625	2,659	4	1·5
von Pirquet negative on entry	(*b*) Not vaccinated	280	561	13	23·2
	(*c*) Vaccinated and became positive	287	910	1	1·1
	(*d*) Vaccinated and remained negative	107	204	1	4·9

P.T. = Pulmonary tuberculosis.

It will be seen first of all that the nurses in subgroup *b*, who were von Pirquet negative and were not vaccinated, suffered much more heavily from pulmonary tuberculosis than those in subgroup *a*, who were initially von Pirquet positive. The difference between groups *c* and *d* is very much less, and by the ordinary statistical tests would not be regarded as significant.

Before regarding the difference between groups *a* and *b* as conclusive two points must be noted. In the first place the girls had been subjected to a careful medical examination before being accepted as probationers, and any girls with a history of tuberculous disease or showing evidence of tuberculosis were rejected. The effect of this would be to reduce the number of subjects in group *a* who developed pulmonary tuberculosis during their training period. Secondly, instead of following up initially positive and initially negative nurses over the same length of time, Heimbeck transferred in his analysis the initially von-Pirquet-negative nurses to the positive group within one year of their primary infection. The result was that if the nurse developed symptoms of tuberculosis within a year of her primary infection she appeared among the initially negative group that became tuberculous. If, on the other hand, she showed no evidence of tuberculosis for a year or more she went to swell the number of the initially von-Pirquet-positive group that remained free. Since the majority of tuberculous lesions in initially tuberculin-negative nurses seem to occur during the year following the appearance of a positive reaction (Israel, Hetherington, and Ord, 1941 ; Daniels, 1944), the effect of this transfer must have been to increase the disparity between the two groups and weight the odds in favour of the initially tuberculin-positive group. (It is a little doubtful how the groups were finally constituted, but in this account I have adhered strictly to that given in Heimbeck's paper).

Vaccination of Primitive Peoples with B.C.G.

Starting in 1935, a carefully controlled study, lasting for six years, was made by Aronson and Palmer (1946) among North American Indian children and young adults. The subjects, who ranged from 1 to 20 years of age, were tuberculin-tested with P.P.D. (purified protein derivative). Those who failed to react to 0.005 mg. were divided at random into two groups.

The first group, which comprised 1,550 persons, were injected intracutaneously with 0.1 or 0.15 mg. of B.C.G. ; the second group, which comprised 1,457 persons, were injected with 0.1 ml. of sterile saline. An initial *x*-ray film was taken to exclude those with evidence of pulmonary tuberculosis, and the inoculated subjects were re-examined annually by the tuberculin test and by radiography. The expert who read the *x*-ray films did not know to which group any given subject belonged. Analysis showed that the two groups were very similar in age, amount of exposure to tuberculous infection, and completeness of the follow-up. The results are summarized in Table IV.

TABLE IV.—*B.C.G. Vaccination of North American Indian Children and Young Adults (Aronson and Palmer, 1946)*

Group	No. of Subjects	No. Developing N.P.T.	No. Developing P.T.	Tb. Case Rate per 1,000 Person-years*	No. of Deaths from all Causes	No. of Deaths from Tb.
Vaccinated ..	1,550	9	8	2·0	34	4
Non-vaccinated	1,457	48	20	9·0	60	28

* Pleural effusion and hilar gland enlargement excluded.

As in the record of Heimbeck's investigations, I have purposely omitted cases of pleural effusion and enlarged hilar glands from the pulmonary tuberculosis figures so as to make the comparison between the vaccinated and control groups more definite. It will be noted from Table IV that the incidence of pulmonary, and still more of non-pulmonary, tuberculosis was considerably higher in the group receiving saline than in that receiving B.C.G., and that the tuberculosis mortality was seven times as high in the control as in the vaccinated group.

These figures are very suggestive, but it may be questioned whether the conclusions drawn from them can legitimately be transferred to civilized peoples having a higher degree of genetic immunity and exposed, as a rule, to a lower risk of infection. Some indication of the lack of similarity between the North American Indians and the ordinary population of the United States is afforded by the great difference between them in the incidence of non-pulmonary tuberculosis. In Aronson and Palmer's control group, for example, the ratio of non-pulmonary to pulmonary tuberculosis was about 2½ to 1, whereas in the United States as a whole, during the years 1935–41, the ratio among persons of 1 to 25 years of age, as judged by the recorded deaths (figures for incidence not available), was about 1 to 5. It is, in fact, doubtful whether the same proportionate degree of protection is likely to be conferred by vaccination in a community such as our own as in a race of people in which the natural history of tuberculosis is so very different. In this connexion it may perhaps be well to remember the law of diminishing returns.

Discussion

Within such a short compass as is here allowed it is impossible to do justice to the full claims for B.C.G., but I have selected for review those investigations which come more closely to a controlled laboratory experiment than any others. Even so, it must be admitted that the results of all but one of these investigations are inconclusive. What we have got to decide is whether the routine use of B.C.G. *in this country* would diminish the total tuberculosis incidence and mortality. It is clearly impossible to estimate numerically the advantage that such a course would have, or even to be sure that it would have any advantage at all. Assuming, however, that B.C.G. does afford some measure of protection against the development of clinical tuberculosis, let us consider the difficulties and disadvantages that its use might entail.

(1) B.C.G. is a live vaccine, and should be used within a week of its preparation. This means that very great care has to be taken in its preparation to avoid contaminants, and in its distribution to make sure that a high proportion of the organisms are alive at the time of injection. (2) The virulence of B.C.G. is not fixed. If it is too virulent harmful reactions may occur in those who are injected; if it is not sufficiently virulent the degree of protection it affords will be reduced. (3) The injection has to be made intracutaneously with considerable care. If the vaccine is injected too deeply serious ulceration may occur at the site of injection in a high proportion of subjects and persist for weeks or months, sometimes accompanied by suppuration of the regional lymphatic nodes. Even if the injection is made strictly into the superficial layers of the skin a small local ulcer may normally be expected to develop (Holm, 1946). It is true that some of the disadvantages of intracutaneous injection are said to be avoided by the multiple-puncture method (Birkhaug, 1944), but too little experience of this method is as yet available to justify the claims of its author. (4) The infants of tuberculous mothers must be separated at birth, or, if taken away at a later age, they must be separated for at least six weeks to exclude the possibility of their having already acquired tuberculous infection by the natural route before they can be vaccinated. (5) After vaccination they should be separated from their parents for two to three months in order to allow a reasonable degree of immunity to develop. (6) Infants separated in this way and kept in residential nurseries may be exposed to serious risk of cross-infection, and develop pneumonia or gastro-enteritis, either of which may prove fatal. (7) Since the B.C.G. organisms die out in the human body, it is desirable to revaccinate the child at intervals to ensure the continuance of immunity.

Taken individually, none of these disadvantages need be regarded too seriously, but taken together they do combine to render B.C.G. vaccination very much more formidable than vaccination against smallpox or diphtheria. Even if it is assumed that B.C.G. is of value it must be asked whether it should be applied to the whole population or only to selected portions of it. When it is realized that in England and Wales the chances of dying from tuberculosis in the first year of life are 1,740 to 1 against, I think we may conclude that universal vaccination of the infant population is out of the question. If it was pressed it would almost certainly result in the partial substitution for highly reliable prophylactic procedures, such as vaccination against smallpox and diphtheria, of the very much more doubtful procedure of B.C.G. vaccination, since a considerable proportion of parents would refuse to have their children inoculated with all three agents—particularly if the B.C.G. vaccination, which would normally be given first, was followed by any serious local disturbance. The alternative, therefore, would be to restrict B.C.G. vaccination to those groups of the community, such as the infants and children of tuberculous families, and medical students and nurses, who are exposed to an unusually high risk of developing tuberculosis (see Cox, 1929; Ridehalgh, 1942; Daniels, 1944). If it is adopted for these groups, then infants and children should be separated for a time from their tuberculous parents for the reasons that have already been stated, and care should be taken that medical students and nurses are kept away from any known source of tuberculous infection for six to twelve weeks after vaccination.

Before we commit ourselves to adopting this course it would be of great help if a properly controlled investigation on human beings could be carried out in this country. The difficulties of such a task are not underestimated, but unless we do attempt to measure the advantage so gained we shall never know the real value of B.C.G. vaccination, and we may not even know whether it is of any value at all in the circumstances in which we use it. It is suggested that a suitable trial might be carried out on probationer nurses entering the London and larger provincial hospitals. The results of the Prophit investigation (Ridehalgh, 1942; Daniels, 1944) have shown that about 20% of these nurses are tuberculin-negative at the start of their training course. Forty thousand nurses should therefore include 8,000 who are suitable for investigation. Alternate tuberculin-negative nurses should be vaccinated with B.C.G. and the remainder should receive some control fluid indistinguishable in appearance from it. If 0.5% of the nurses in the control group develop pulmonary tuberculosis annually, and if the average period of follow-up is two years, the number of cases in this group should amount to 40. If the B.C.G. vaccination is really effective the number of cases in the vaccinated group should be small enough to render the difference between the two groups significant. It is realized, of course, that the 40,000 nurses required initially for testing could not be obtained at once, but if 4,000 to 8,000 were taken into the investigation every year an answer should be forthcoming in about five to ten years.

In an investigation of this sort I feel that the comparison between the two groups should be confined to pulmonary tuberculosis of reasonable severity. I shall not attempt to define this more accurately now. My point is that if minimal pulmonary, glandular, and other manifestations of tuberculosis are included it may be possible to swell the number of tuberculous cases in the control group, as in Heimbeck's (1936) figures, and make out a theoretically convincing but practically unimportant case for B.C.G. vaccination. Should such a properly controlled trial prove impracticable, then I would suggest that B.C.G. vaccine should be liberated for use only under strictly defined conditions ensuring the most careful follow-up of the vaccinated subjects with some degree of central supervision.

If B.C.G. vaccination is to be undertaken the gains must be commensurate with the disadvantages; and unless it can be shown that the morbidity and, particularly, the mortality from tuberculosis are substantially lowered I should regard it as doubtful whether routine vaccination of all tuberculin-negative nurses and medical students was worth while adopting. When it is realized that during the whole of the Prophit survey, which lasted for ten years, only two nurses died from tuberculosis, giving an annual mortality rate one-third of that for the female population of corresponding age in England and Wales, it may be wondered whether the relative degree of immunity that B.C.G. vaccination may possibly confer is likely to be of any substantial value in practice, and whether almost equally good results might not be achieved by measures designed to protect nurses from undue exposure to infection.

Infants and children in tuberculous families present a rather different problem. Presumably the best answer, as a rule, is to remove the tuberculous member of the family from the house; but if this is not practicable the children should be removed. This has got to be done temporarily in any case if they are to be vaccinated, as all the protagonists of B.C.G. insist that separation for a time is necessary if the best results are to be obtained. If temporary removal has got to be practised, it is surely worth while considering whether separation should not be continued till the tuberculous member of the family has been cured, has died, or has been admitted to an institution for chronic cases.

One more word. Is it really worth while vaccinating infants at birth? We are still ignorant of the time the antibody-producing mechanism takes to reach maturity, but we have reason for believing that the tissue response to antigenic stimuli during the first few months of life is less than it is by the end of the first year. That is why inoculation against diphtheria is usually delayed till nine to twelve months after birth. Is there any reason for believing that the tissue response to a vaccine against the tubercle bacillus is likely to be more active than that against other antigens? If not, would it not be better to remove the infant from its tuberculous home at birth and delay vaccination with B.C.G. till it is at least 6 months of age? That this objection is not purely hypothetical is borne out by the finding that infants at birth require larger doses of B.C.G. than older infants to render them tuberculin-sensitive, and take a longer time to become allergic (Wallgren, 1947).

Summary and Conclusions

Investigations are reviewed in which a control group of persons was studied along with a B.C.G. vaccinated group.

Though a presumptive case for the value of B.C.G. vaccination has been established, it is concluded that the documentary evidence so far available is insufficient to allow any estimate to be made of the degree of protection it affords or even to prove conclusively that, in a civilized population, it has any protective effect at all.

Some of the disadvantages of B.C.G. are enumerated, and it is argued that, unless the gains from its use are likely to be substantial, B.C.G. vaccination in this country may not be worth while undertaking.

Since the risk of dying from tuberculosis in the first year of life is so small, universal vaccination of infants is clearly out of the question, and vaccination, if it is used, should be restricted to specially exposed groups, like nurses, medical students, and children in tuberculous families.

It is pointed out that the tuberculosis mortality among nurses in the Prophit survey was only a third of that among the corresponding female population in England and Wales; and it is doubted whether the relative degree of immunity that might be conferred by B.C.G. vaccination would have any greater effect in lowering the mortality than measures designed to shield nurses against undue risk of exposure to tuberculous infection.

It is further pointed out that infants and children of tuberculous parents must be separated from their homes for two to three months after vaccination with B.C.G. in order to allow immunity to develop; and it is questioned whether it might not be wiser to prolong this separation till the infecting member of the household has been cured, has died, or has been removed to an institution for chronic cases.

Since the normal antibody-producing mechanism does not seem to reach maturity till towards the end of the first year of life it might be better, if B.C.G. is to be used, to remove the infant from its tuberculous home at birth and delay vaccination with B.C.G. till it is at least six months of age.

A plea is entered for the carrying out of a properly controlled trial of B.C.G. vaccination in Great Britain, or, if this is impracticable, for the liberation of the vaccine only under strictly defined conditions.

I am indebted to Prof. A. Bradford Hill for help in assessing the evidence in some of the investigations reviewed in this paper.

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SYMPATHECTOMY AND INTRASPINAL ALCOHOL INJECTIONS FOR RELIEF OF PELVIC PAIN*

BY

J. P. GREENHILL, M.D.

Professor of Gynaecology, Cook County Graduate School of Medicine, Chicago

Pain may be either acute or chronic. In women acute pelvic pain is not infrequent, and may be due to such causes as rupture of an ectopic pregnancy or of a corpus luteum cyst, or sudden torsion of an ovarian cyst. Such causes of pain may be relieved instantly and dramatically by a surgical operation. Likewise, in many cases in which the pain is chronic, as in pelvic inflammatory disease and endometriosis, an operation that removes the source of the pain brings relief. However, there are many women who suffer severe pain and in whom removal of its cause is either impossible or inadvisable. In this category are women with inoperable carcinoma of the uterus or severe dysmenorrhoea, women subjected to repeated unsuccessful laparotomies for the relief of pelvic pain, and young women with endometriosis who should not be castrated.

For the intractable pain associated with carcinoma of the uterus, particularly of the cervix, most physicians prescribe an opium derivative such as morphine, "pantopon," codeine, or "dilaudid." These drugs are temporarily helpful, but eventually the patient becomes refractory to them. The reasons for this inadequacy are: (1) the potential tolerance for the drugs increases enormously, so that larger and larger doses are required, resulting in a constant increase in expenditure for the drugs until the poor patient can no longer afford them; (2) in some people the opium derivatives produce nausea and vomiting; and (3) a few individuals become drug addicts.

To secure more or less permanent relief from the excruciating pain which is associated with cancer of the uterus, severe dysmenorrhoea, endometriosis, and the distressing pain of unknown origin, I recommend two useful procedures. The first is pelvic sympathectomy, or removal of that part of the sympathetic nerve plexus known as the presacral nerve or the superior hypogastric plexus. The second is intraspinal injection of alcohol.

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Sympathectomy is an operation that any surgeon may perform readily. The risk involved is slight, the technique is not complicated, and local infiltration analgesia may be used for a large part of the operation and in some instances for the whole of it. Furthermore, since the abdomen must be opened to carry out this procedure, it enables one to determine the extent of the growth of endometriosis, the amount of carcinomatous involvement, and any pathological process not discovered before the operation.

Of the two questions that are rightfully raised the first is whether the fibres of the sympathetic system are really sensory. Ranson (1926, 1930) confirmed the proof that was offered by Edgeworth. All the motor fibres degenerate, but the sensory fibres remain intact if the roots of the spinal nerves are cut proximal to the spinal ganglia.

Vasoconstriction of the blood vessels of the internal genital organs and inhibition of the secretion of the genital glands are produced by the hypogastric plexus, whereas the parasympathetic nerves have an opposite effect. The normal menstrual cycle is not altered by section of the superior hypogastric plexus nor does it interfere with uterine contractions during labour; neither does section produce glandular atrophy or any disturbance in the motor function of the bladder or rectum. Therefore the nerve fibres of the superior hypogastric plexus are sensory and not motor. Their function is to carry sensations from the internal genital organs to the medullary centres. Hence resection of the portion of the superior hypogastric plexus above the hypogastric ganglion is a simple way of relieving a patient of severe pain arising in the pelvic organs.

The second question concerns any possible harm that may follow removal of a portion of the sympathetic nervous system. Ranson (1926, 1930) states that Cannon and his students completely removed "the sympathetic chain on both sides, from the highest cervical to the lowest sacral ganglion. Such completely sympathectomized cats have lived under laboratory conditions for many months. Everything indicates that almost any part of the sympathetic system can be removed without seriously endangering life."

Indications for Pelvic Sympathectomy

Pelvic sympathectomy will almost completely relieve the intractable pain in about half of the cases of Group III and Group IV carcinoma of the cervix, and it will partially relieve many more. The operation (Greenhill and Schmitz, 1933) should be performed as a prophylactic measure in all cases in which a laparotomy is done for carcinoma of the cervix of the corpus uteri. Should recurrence of the cancer follow the procedure there will be considerably less pain than if the sympathectomy had not been performed. It has been reported by de Sousa Pereira (1946) that in women with cancer of the cervix subjected to pelvic sympathectomy the results of the post-operative irradiation are better than if sympathectomy had not been performed, because the vasodilatation produced by the sympathectomy improves the circulation. Pelvic sympathectomy is also indicated in selected cases of primary dysmenorrhoea in which all medication, including hormones and minor surgical measures, has been tried without avail. The results in dysmenorrhoea are excellent. I have not yet had a failure in my dysmenorrhoea cases (Greenhill, 1940).

Another but infrequent indication for pelvic sympathectomy is persistent pain in the lower abdomen not relieved by repeated laparotomies. Occasionally women are seen who have had several laparotomies for the relief of pain. Usually the first operation was an appendicectomy, then an operation for an ovarian cyst, and then one or more operations for adhesions. In such women, even if the cause of the pain is not removed, dramatic relief will follow pelvic sympathectomy.

Still another field of usefulness for pelvic sympathectomy is in cases of endometriosis in which conservatism is advisable. Of course if both ovaries are removed the endometriotic areas cease to grow. However, spaying is not desirable in young women. In all instances in which conservatism is desired a pelvic sympathectomy should be performed. The operation not only relieves pain but also seems to have some beneficial effect on the endometriosis, probably due to the vasodilatation which follows the procedure.

Technique of Pelvic Sympathectomy

The operation to be described was recommended by Cotte (1931, 1932). Since some patients who are subjected to this operation are poor surgical risks it is best to open the abdomen under direct infiltration analgesia. The rest of the operation is readily performed under a short ethylene or ether anaesthesia or even under infiltration analgesia. The patient is placed in the Trendelenburg position after a midline incision of 10–12 cm. has been made from the umbilicus down towards the pubis. After the peritoneal cavity is opened the small intestine is packed off and the sigmoid and rectum are pushed to the left side and held there with a wide retractor. Then the uterus, adnexa, and bladder may be inspected readily and palpated to determine the extent of the pathogenic processes. One may also detect a complication that can be remedied surgically. The area of the two lower lumbar vertebrae and the upper part of the sacrum is exposed. In some thin women the presacral plexus can be seen immediately beneath the peritoneum. Whether or not the plexus can be seen, the parietal peritoneum above and in the middle of the sacral promontory is elevated and incised. This incision is extended upwards and down along the sacrum for 4–5 cm. A layer of fibrocellular connective tissue covered by adipose tissue will be exposed when the peritoneal flaps are pulled aside. This tissue can be separated easily from the peritoneum and the lower end of the aorta without hazard. The presacral plexus lies in this layer of tissue. With an aneurysm needle the tissue is elevated at the bifurcation of the aorta and the dissection is carried to a still higher level. As this is done it will be observed that in most instances the tissue spreads out triangularly. The middle sacral artery should be pushed away from the nerve, but if it is injured it can be ligated readily.

After the dissection is carried as high as desired the layer of nerve tissue is separated from the underlying tissue beyond the sacral promontory into the pelvic cavity. The plexus in this area is divided into two hypogastric nerves; hence it is necessary to dissect each nerve separately. At least 2 or 3 cm. of each hypogastric nerve should be resected in addition to 4 cm. or more of the superior hypogastric and the intermesenteric plexuses. The layer of fibrous tissue containing the hypogastric nerves is much more resistant than that containing the presacral plexus. As the dissection progresses nerve filaments projecting outward will be encountered. These should be followed as far laterally as possible before they are cut. In most instances ganglia will be included in the resection. It is preferable to remove the dissected tissue in one piece. It is not necessary or advisable to ligate the presacral plexus or the hypogastric nerves before cutting them, because only insignificant vasa nervorum are in intimate contact with them. Rarely is bleeding encountered that requires more than simple temporary pressure to check it. (When the mesosigmoid is extremely short, injury to the inferior mesenteric vessels must be avoided.) After the nerve tissue is resected the

posterior parietal peritoneum is sutured with plain catgut and the abdominal wall is closed in the customary way. Since women with inoperable carcinoma are usually cachectic and therefore show poor wound healing, silkworm gut or other permanent suture material should be used in closing the abdominal wall.

Intraspinal (Subarachnoid) Alcohol Injections

The injection of alcohol into nerves for the relief of pain has been in use for many years, but not until recently has it been employed for the relief of pelvic pain. In 1931 Dogliotti recommended subarachnoid injection of alcohol for the relief of pain. He chose the subarachnoid space because this area is the most central one for attacking the nerve roots and its injection prevents all painful peripheral stimuli from reaching the medullary centres, even if the stimuli act at the level of the spinal ganglia, the intervertebral foramina, or the spinal roots. Absolute alcohol is the preferred drug because it has no secondary toxic effects. It is easily and rapidly diffused and has a specific gravity much lower than that of the spinal fluid, hence its rise immediately affects the nerves. Most of Dogliotti's patients had sciatic pains, but not one of them had carcinoma of the genitals. The first reports on the use of intraspinal alcohol injections for cervical carcinoma were published almost simultaneously in 1934 by Saltzstein and by Stern.

In 1934 I began using intraspinal injections of alcohol for excruciating pain associated with malignancy in the female pelvis (Greenhill and Schmitz, 1935, 1936). In a series of well over 100 cases of Group III and Group IV carcinoma of the cervix treated by Schmitz and myself complete relief was obtained in about 60% and partial relief in 10%. The relief usually lasts many months—sometimes until the patient dies of the cancer. The only patients with inoperable carcinoma of the cervix who are not suitable candidates for intraspinal alcohol injections are those whose pain is in the renal area and in the parametrium from stricture of the ureter associated with hydro-ureter and hydronephrosis. The technique of intraspinal (subarachnoid) injection of alcohol is simple, and it is performed quickly and with little discomfort. However, since there is a possibility that in some cases the spinal cord may be injured, the procedure should be used only in cases of cancer.

Technique of Intraspinal Alcohol Injection

No preliminary medication is given, because observation of the immediate effects of the injection is desired. The pain in most patients with advanced carcinoma of the pelvic organs is more intense on one side than on the other. The patient is placed on the side opposite to that in which most of the pain is present. A pillow or pad is placed under the pelvis and side to elevate the sacral and lumbar portions of the spine, the back is arched as much as possible, the body is turned somewhat ventrally, and the head is lowered slightly. By placing the patient in this position the sacrolumbar area of the spine is raised to the highest level, and at the same time the posterior or sensory nerve roots are caused to lie horizontally. The anterior or motor nerve roots come to lie in a plane that is usually out of reach of the alcohol. Even if the motor nerves are not removed from the field of the alcohol, as occurs in the cauda equina, they are often not affected, since sensory nerves are more susceptible than motor fibres to the effects of alcohol. This is because the sensory nerves have less myelin.

The patient should be held in the proper position. A weak solution of iodine or other antiseptic is applied over the lumbar and upper sacral areas. Injection is made in the second, the third, or (usually) the fourth lumbar interspace with an ordinary lumbar-puncture needle with a stylet. Procaine ("novocain") is injected into the skin before the needle is inserted into the desired interspace just as for an ordinary lumbar puncture. After the needle is in the subarachnoid space, as shown by the flow of spinal fluid, 0.75 ml. of absolute or 95% alcohol is injected into the cerebrospinal fluid. For this purpose it is best to use a tuberculin syringe to ascertain that not more than 0.75 ml. of the solution is injected. Furthermore, the alcohol must be injected very slowly, drop by drop: about two minutes is allowed for the injection of the 0.75 ml. The alcohol rises and immediately surrounds the posterior roots because its specific gravity is about 806, whereas that of the spinal fluid is 1007 to 1001. No spinal fluid should be drawn into the syringe to mix with the alcohol. After the injection is made the needle is withdrawn and the puncture hole is covered with sterile gauze and adhesive tape.

Before the injection is completed the patient will complain that the upper leg feels numb or hot and that she cannot move her leg. The numbness is almost routine after the injection, but it disappears spontaneously after a few hours or days in most instances. In spite of what the patient says concerning her inability to move the leg, when she is requested to do so she will encounter no difficulty. At the same time that the patient remarks about the numbness she also says, either voluntarily or in answer to a query, that the pain has disappeared. The results are better if the patient is permitted to lie on the side for some time. Therefore she should be kept on the side for two hours after the injection; then she is permitted to get up and walk around. At times a patient may find difficulty in getting up from a chair because her "leg is asleep." In other instances the leg feels heavy and the patient experiences some trouble in walking up steps because the knee flexes readily. These sensations usually disappear in a few hours, although in some patients they may be present for a number of weeks.

Nearly all ambulatory patients may be permitted to go home within three hours after the injection without ill effects. However, it may be best to keep a patient in a hospital for twenty-four hours after the injection. I should like to emphasize that the intraspinal injection of alcohol may be carried out easily in a patient's home. This is important, since many individuals with cancer are bedridden at home, and there is no need to subject them to the inconvenience and expense of transporting them to office or hospital. If the patient has pain on both sides an intraspinal injection of alcohol is made a week later with the patient lying on the opposite side. The same amount of alcohol is injected.

Comparison of Results

An analysis of my cases of carcinoma of the cervix treated by pelvic sympathectomy and by alcohol injections revealed that better results were obtained with intraspinal injections. In addition to the greater percentage of patients relieved by injections of alcohol, this procedure is far simpler than sympathectomy, since it does not require a stay in hospital. Therefore I believe that all women who have severe pain associated with carcinoma of the cervix should have an intraspinal injection of alcohol. More than half of such women will obtain complete relief and in a few others the benefit will be partial.

Intraspinal injections of alcohol should be used only in women with cancer, because there is definite risk of injury to the spinal cord. For women who have excruciating pain due to menstruation, endometriosis, and unknown causes pelvic sympathectomy is preferred.

Summary

I have briefly described two procedures which may be used to relieve intractable pelvic pain in women. One of these—pelvic sympathectomy—has proved most helpful in cases of carcinoma of the uterus, dysmenorrhoea, endometriosis, and pelvic pain of unknown aetiology. In inoperable cases of cancer pelvic neurectomy is helpful not only for the relief of pain but also as a prophylactic procedure at the time of hysterectomy. Likewise, pelvic sympathectomy is of great benefit in cases of endometriosis treated conservatively, not only because it relieves the pain but also because it apparently improves the endometriosis. Nearly all cases of severe primary dysmenorrhoea can be cured by sympathectomy, but this operation should not be done until all conservative measures have proved futile. Finally, in cases subjected to a number of laparotomies without relief of pain pelvic sympathectomy will yield spectacular results.

Intraspinal (subarachnoid) injection of alcohol is another means of obtaining relief from excruciating pelvic pain. This procedure is much simpler than pelvic sympathectomy and does not even require treatment in hospital. Furthermore, the percentage of patients with uterine carcinoma who obtain relief is higher than with pelvic sympathectomy. Nevertheless, because this procedure may injure the spinal cord it should not be used for any individual except one with cancer.

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RELIEF OF PAIN IN INTRACTABLE CANCER OF THE PELVIS

BY

MEAVE KENNY, M.D., F.R.C.O.G.

University Reader in Obstetrics and Gynaecology, Postgraduate Medical School of London

Cancer of the pelvic organs—intractable by surgery or irradiation, or recurrent after such measures—may condemn a man or woman to unnumbered hours of pain before death. Such people may die hard, being often in the prime of life and general health, and capable of service and happiness in their remaining days if relief from pain could be given them without impairing their mental and bodily functions. Opiates in increasing doses, neurectomies, and intrathecal injection of alcohol often increase the nursing responsibilities and make the last days of the sufferer odious to himself and to his nearest.

The treatment of such patients is surely a part of the treatment of cancer, yet among the great number of papers devoted each year to the subject of cancer of the urogenital tract alone the means of relief in hopeless cases is barely mentioned, and the average practitioner, who must shoulder their care, may have the impression that skilled surgical procedures, sometimes unavailable or impracticable, offer the greatest measure of help.

Here is described a means of relief which has borne some careful trial and which is recommended for effect and simplicity and because it can be used at need again and again until the end. This is the method of caudal analgesia.

It has seemed right to me to describe it in some detail, for this paper is addressed particularly to the general practitioner and to those in charge of the chronic sick in homes and infirmaries who may not be familiar with the technique.

The Method

The apparatus consists of : Surgical spirit or "dettol" cream for cleaning the skin, and tincture of iodine or other coloured antiseptic for surface-marking; 1 5-ml. Record syringe; 1 Record-fitting needle, 8/10×1½ in. (3.75 cm.); 2 10-ml. Record syringes; 1 Record-fitting needle, 15/10×3 in. (7.5 cm.), bore 2; procaine, 1.5% solution; "proctocaine," 40–60 ml. (procaine 1.5% w/v, butyl *p*-aminobenzoate 6% w/v, with benzyl alcohol in arachis oil).

The patient is placed across the bed in the left lateral position and the buttocks and sacrococcygeal area are cleansed and disinfected. The caudal opening of the sacral canal is identified (usually with ease, and more easily in men than in parous women, who may have had the coccyx displaced in childbed) and marked with a dab of iodine. A subcutaneous weal is raised at this point with the 1½-in. needle attached to the 5-ml. syringe charged with the procaine 1.5% solution, and through this the tissues down to the tough fibrous membrane closing the sacral canal are infiltrated. The needle is then withdrawn, and after two minutes the stout 3-in. needle is made to follow the track of the first needle, at an angle of 45 degrees to the skin, until the fibrous membrane is encountered and pierced; then the needle is depressed to an angle of 15 degrees and pushed steadily on until the operator is sure that about 1 in. (2.5 cm.) of its length is lying freely movable within the space of the sacral canal. The needle, which after withdrawal of the piston reveals neither blood nor spinal fluid, is then attached to the 5-ml. syringe recharged with procaine and the whole is injected boldly. The beginner will know if he is posterior to the sacrum by the appearance of a subcutaneous swelling, or anterior—between rectum and sacrum—by an exploring finger in the anus. Convinced of his correct position by the free flow of the anaesthetic and by his observations, the operator detaches the syringe and replaces it with one of the 10-ml. syringes charged with warmed proctocaine. He then steadily injects the proctocaine to an amount varying with the skeletal size of the patient—usually 40 to 60 ml.—taking some ten minutes to do so, meanwhile testing every minute the levels of cutaneous anaesthesia to pin-prick of the perineum, thighs, buttocks, and abdominal wall, and asking the patient to say when relief of his pain takes place, although it is usually pleasantly evident from the gradual relaxation of attitude and expression. When this becomes known, or if the level of skin anaesthesia rises to nipple level, the injection is stopped and the syringe detached.

Sometimes complete relief is obtained at once, but sometimes it comes only when the patient is eased on to his right side, is made to stand up, or lies on his back with the foot of the bed raised for a few minutes. Sometimes the greatest relief comes after a period of lying on the back with the buttocks raised on a pillow, so as to allow the oily solution to seep higher, although it is better to inject 6 to 10 ml. more through the still present needle and obtain effect at once. For in this, as in all cases of long-continued and severe pain, the habit of suffering is best broken swiftly and convincingly. Most often the sufferer is at once so eased of the superflux of his pain that he endures the rest with fortitude; and having co-operated to obtain the result—knowing that by such simple means relief can be obtained again if necessary and that probably the pain will come no more—a pride in living returns.

In such circumstances I have seen an old dancer brought into the clinic in a wheeled chair, with both thighs drawn up on to the abdomen in painful spasm due to cancerous infiltration of the psoas muscles, and then after the injection straighten herself off the couch, at first gingerly, and then smilingly assume several poses of the ballet before the watching delighted class of students and nurses.

I and my assistants have so treated 17 patients with cancer of the uterus, bladder, prostate, and vagina. Of these one—a man aged 58 with prostatic cancer, who was

incapacitated with pain for three months—was able to return to his work as a milk-roundsman for the rest of his life (nearly seven months) and die easily of a haemorrhage. He needed only one injection of 50 ml. of proctocaine. The ballet dancer, aged 46, died quietly of cardiac secondaries from cancer of the cervix uteri after two injections of 40 ml. of proctocaine, the second injection being fortified with 5 ml. of absolute alcohol, nine weeks after her first visit to us. The duration of relief with one to three injections varied in 11 others from three weeks to four months; in all but four this marked their natural term. The four developed painful secondaries in other regions, and one of them had a neurectomy for this reason.

One other, a tough Welsh miner of wonderful physique with extensive invasion of the abdominal wall by a cancer of the bladder, died apparently from exhaustion and haemorrhage under thiopentone anaesthesia, given before attempting the caudal injection, as in no other way could the unfortunate man bear being turned on his side. This was our only disaster. Necropsy was refused, so that oil embolism could not be ruled out as the immediate cause of the sudden death shortly after the caudal injection was begun. He had suffered hideous pain for some weeks before.

Two women with pelvic secondaries from uterine cancer had apparently complete relief for a few days after injection, but on return of symptoms failed to be relieved by further injection. In one, intestinal obstruction by secondaries was proved at necropsy; in the other, massive abdominal and pulmonary secondaries proved fatal under opiates.

One man with prostatic cancer was not relieved at all; radiography had revealed spinal metastases, and he was kept under morphine for the few weeks left.

I have not observed or been told of any urinary or faecal incompetence following caudal injection of proctocaine, with or without added alcohol, in any of the patients treated.

I wish to thank Drs. Constance Wood and Lilian Walter, of the Medical Research Council Radium Centre in the British Postgraduate Medical School, for referring to me patients in their wards; my colleague in the Department of Obstetrics, Dr. Hilda Roberts, who assisted me with many of the injections; and my colleagues of the Department of Surgery for asking me to treat most of the male patients mentioned in this paper.

"Diet in Pregnancy" was the subject chosen by Prof. W. C. W. Nixon for his lecture at the Royal Institute of Public Health and Hygiene on Nov. 12. Sir Jack Drummond, F.R.S., was in the chair. In a community where diet was faulty or restricted, said Prof. Nixon, the mother, expectant and nursing, and children suffered first. Did the pregnant woman differ from the rest of the community regarding her dietetic requirements? Everyone agreed that in pregnancy those were increased. Natural foodstuffs were far better than synthetic tablets. It may be argued that, with the present food restrictions, it was impossible to attain anything like the ideal diet for a pregnant woman. However, a remarkably good diet had been planned by, for example, a Scotch hospital. The nutrients were obtained only from natural foods, but the margarine was fortified with vitamins A and D, and full use made of the additional rations available for pregnant women. Recent reports from America showed the benefit that resulted from increasing the protein intake during pregnancy. It had been found that the incidence of toxaemia in pregnancy was twice as great in one group of pregnant women, where protein intake was 60–70 g. daily, as compared with a similar group whose protein intake ranged from 110 to 120 g. daily. The health of a nation could be gauged by the vital statistics of pregnancy and infancy. He would like to quote from the Report of the Chief Medical Officer of the Ministry of Health on the state of the public health during the six years of war (1939–45): "The national provision of milk and vitamin supplements . . . together with rationing and the greatly improved quality of the national loaf, has contributed to the gradual decline in the maternal, neonatal, and infant mortality and stillbirth rates." Women of younger years were only too willing to be educated in health matters when these were explained simply. It was in this way that the mothers of our country would be guided to contribute to one of the greatest measures in public health—proper nutrition.

STAPHYLOCOCCAL INFECTION DUE TO PENICILLIN-RESISTANT STRAINS

BY

MARY BARBER, M.D.

(From the Department of Bacteriology, British Postgraduate Medical School, Hammersmith Hospital)

The incidence of strains of *Staphylococcus pyogenes* that are grossly resistant to penicillin is clearly increasing rapidly. The rate of increase in this hospital at present is so rapid as to be somewhat alarming. In a previous study (Barber, 1947) all cultures of *Staph. pyogenes* occurring in the routine bacteriological laboratory were tested for penicillin sensitivity; out of a series of 200 patients yielding cultures of *Staph. pyogenes* penicillin-resistant strains were isolated from 25 (12.5%). Since then cultures have been tested for their reaction to penicillin only if they came from an infected lesion. In analysing a series of 100 patients with staphylococcal infection between February and June, 1947, it was found that as many as 38 yielded penicillin-resistant strains. Table I gives a comparison of the two series. In order to make a fair comparison, in Series 1 the figures for staphylococci isolated from cases of infection are given separately as well as figures for all specimens tested. In view of the high incidence of resistant strains in Series 2 it was thought worth while to record this second series, together with some observations on the source of penicillin-resistant strains and the best method for their detection.

TABLE I.—*Analysis of Patients Yielding Staph. Pyogenes*

	From Whole Hospital			From Unit X		
	Total	Penicillin-resistant		Total	Penicillin-resistant	
		No.	%		No.	%
Series 1. Apr.–Nov., 1946:						
All strains ..	200	25	12·5	80	13	16·25
Strains from infected lesions ..	99	14	14·1	14	4	28·55
Series 2. Feb.–June, 1947	100	38	38	25	14	56

Analysis of Resistant Strains

The degree of resistance was in all 38 cases gross (see Fig. 1), and all, except one strain which was not tested, were shown to produce penicillinase; 36 of the strains were found to have a sensitivity to streptomycin approximately equal to that of the Oxford staphylococcus; one strain was not tested against streptomycin; and one strain, which came from a patient with tuberculous meningitis who was being treated with streptomycin was resistant to it.

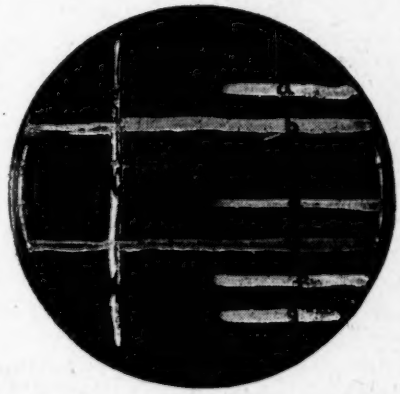

FIG. 1.—*a*, *d*, *f*, and *g* are penicillin-sensitive and *b* and *e* penicillin-resistant strains of *Staph. pyogenes*; *c* is a culture of *Salm. typhi*.

Table II analyses the patients according to type of infection. The case of septicaemia arose from an abscess in the buttock following injections for a refractory anaemia, and the outcome was fatal. The case of osteomyelitis was a chronic infection and gave a mixed growth of *Pseudomonas pyocyanea* and penicillin-resistant *Staph. pyogenes*.

TABLE II.—*Type of Infection in 38 Patients Yielding Penicillin-resistant Strains of Staph. Pyogenes*

Septicaemia	1	Otitis media	4
Extradural abscess	1	Infected operation wounds	3
Osteomyelitis	1	Puerperal infection (local)	2
Respiratory tract infections	8	Superficial lesions	5
Neonatal infections	12	Tuberculous sinus	1

The respiratory infections included bronchopneumonia, infected carcinoma of the lung, actinomycosis, bronchitis, and tracheitis. Several of these cases showed an interesting change in bacterial flora of the sputum during the course of penicillin treatment and will be referred to later. The neonatal infections consisted of four cases of ophthalmia neonatorum, two abscesses, one discharging ear, one buccal ulcer, and four superficial lesions. In most of the 38 cases *Staph. pyogenes* was the only, or at least the predominant, organism isolated; from 10 patients both penicillin-sensitive and penicillin-resistant strains of *Staph. pyogenes* were isolated from the same specimen.

Source of Penicillin-resistant Strains

It is obvious that the main cause for this increase in penicillin-resistant strains of *Staph. pyogenes* is the wide-spread use of penicillin, although a patient yielding such an organism may not himself have ever had any. In the present series 28 of the 38 patients with penicillin-resistant staphylococci had had a fair amount of penicillin before the specimens were taken, two had had a few doses, and eight had had none. For the reasons stated in the previous paper (Barber, 1947) it is my opinion that these strains are not originally sensitive staphylococci which have acquired a resistance to penicillin by contact with it but are naturally resistant strains which survive by a simple process of selection in penicillin-treated infections. That such changes in bacterial flora do take place during the course of penicillin treatment is becoming increasingly clear, and is well illustrated by five of the cases of lung infection in this series.

Patient R. C., a case of carcinoma of the lung, had a sputum heavily infected with *Staph. pyogenes* shortly after admission to hospital; 30 colonies picked from the original culture plate were as sensitive to penicillin as the Oxford staphylococcus, but when a mixed emulsion from this plate was replated on to a penicillin ditch-plate it was seen that a number of penicillin-resistant organisms were present (Fig. 2*f*). Twelve days later, when the patient had had 2.8 million units of penicillin, the sputum again yielded a heavy growth of *Staph. pyogenes*, but 30 colonies tested were all found to be penicillin-resistant. Six cultures from three sensitive and three resistant colonies (one from the first sputum and two from the second) were typed by Dr. Allison and Dr. Hobbs; all three sensitive cultures were phage type 29/52 and serological type 1, whereas all the resistant cultures were serological type III and were not typable by the phage method.

Patients N. H., M. H., and M. S. all had bronchopneumonia. From each the first sputum tested contained no colonies of *Staph. pyogenes*. After 15.9, 11, and 4.8 million units of penicillin respectively, the sputum of all three patients yielded a heavy growth of *Staph. pyogenes*; in patients N. H. and M. H. all the colonies tested were penicillin-resistant, but in patient M. S., who had had the least penicillin, nine colonies were found to be resistant and one sensitive to penicillin.

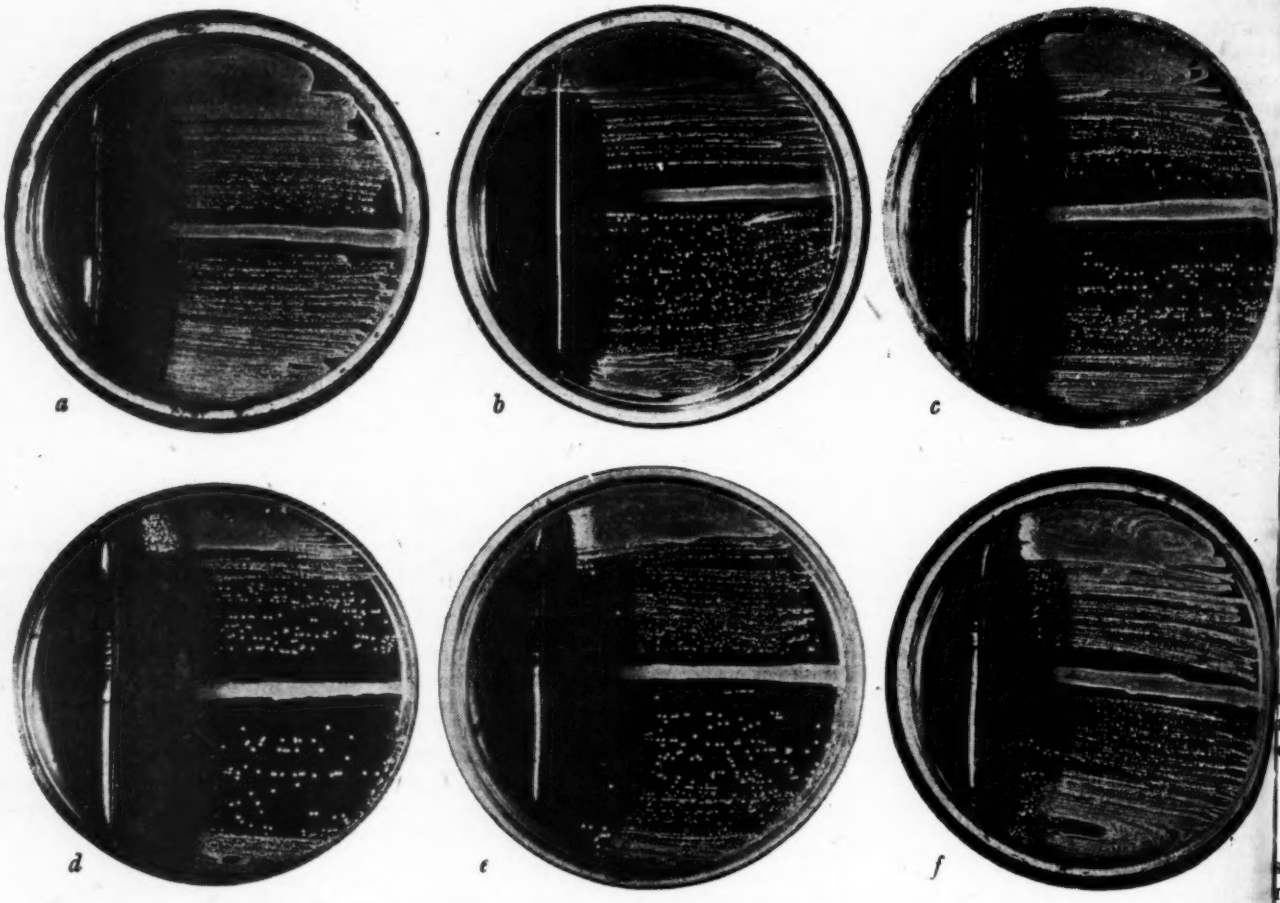

FIG. 2.—Emulsions of bacteria in broth plated out on penicillin ditch-plates with a central streak of the Oxford staphylococcus. (*a*) Pure culture of a penicillin-sensitive *Staph. pyogenes*. (*b*) Pure culture of a penicillin-resistant *Staph. pyogenes*. (*c*) One part penicillin-resistant to 10,000 parts penicillin-sensitive *Staph. pyogenes*. (*d*) One part penicillin-resistant to 5,000 parts penicillin-sensitive *Staph. pyogenes*. (*e*) One part penicillin-resistant to 250 parts penicillin-sensitive *Staph. pyogenes*. (*f*) Emulsion from sputum plate culture of patient R. C. replated on to penicillin ditch-plate, showing that approximately 1 in 250 of the staphylococci were penicillin-resistant.

Patient R.W. had actinomycosis of the lung with an empyema. On admission a heavy and pure growth of *Actinomyces* was isolated, but after 21 million units of penicillin this organism disappeared and pus from the empyema gave a pure growth of penicillin-resistant *Staph. pyogenes*.

The question arises, Where do these penicillin-resistant organisms come from? In some cases—as, for example, patient R. C.—they are clearly present in the original lesion but overgrown by sensitive strains until penicillin treatment leaves them a clear field by getting rid of the latter. Hospital infection with *Staph. pyogenes* is, however, fairly common, and, as Harley *et al.* (1946) have shown, penicillin-resistant staphylococci occur far more often in patients who have been in hospital some time than in new admissions. In any hospital using large quantities of penicillin (and what hospital is not nowadays?) bacteria resistant to its action are probably increasing at the expense of those that are sensitive, and it seems not impossible that in time the resistant organisms will be the sole survivors. That a penicillin-resistant strain of *Staph. pyogenes* once it has got a footing in the hospital may spread from patient to patient is well illustrated by a series of cases occurring in a particular unit of this hospital, referred to hereafter as "Unit X." Throughout the two investigations the percentage of penicillin-resistant strains was higher in Unit X than elsewhere in the hospital (see Table I); five resistant and two sensitive cultures isolated from this unit during a single month were therefore sent to Dr. Allison and Dr. Hobbs for typing. The results are shown in Table III. It will be seen that all five resistant strains were of the same type and that the sensitive organisms were of the same type as each other but different from that of the resistant bacteria.

TABLE III.—*Strains of Staph. Pyogenes Isolated from Unit X*

Source	Date of Isolation	Reaction to Penicillin	Phage Reaction	Serological Reaction
Breast milk	9/10/46	Resistant	6/47	III
" "	18/10/46	"	6/47	III
Caesarean wound ..	27/10/46	"	6/47	III
Cracked nipple ..	22/10/46	"	6/47	III
Sticky eye	4/11/46	"	6/47	III
Breast milk	20/10/46	Sensitive	Nil	I
" "	20/10/46	"	Nil	J

Detection of Penicillin-resistant Strains

From observations made during this investigation it seems that the best method for the detection of penicillin-resistant bacteria in specimens sent to the laboratory is to plate out the infected material direct on to a penicillin ditch-plate, using a concentration of about 10 units of penicillin per ml. of agar in the ditch (Figs. 1 and 2). Although this method is in fact used in many routine bacteriological laboratories the following two reasons for its superiority over other methods are not generally appreciated.

1. Most methods described for determining the penicillin sensitivity of bacteria ignore the size of inoculum used, as it was claimed that within wide limits this made little or no difference to the results (Fleming, 1942; Abraham *et al.*, 1941). As shown by Luria (1946) and Barber (1947), this is far from the case with penicillinase-producing bacteria. With such organisms a small inoculum may appear to be fairly sensitive to penicillin, whereas a large inoculum will grow in a concentration of 100 or more units per ml. This is well illustrated by plating out pure cultures of penicillin-sensitive and penicillin-resistant staphylococci on penicillin ditch-plates. Fig. 2*a* shows a sensitive culture which gives a fairly straight line of inhibition. Fig. 2*b*, on the other hand, shows a pure culture of penicillin-resistant staphylococci, and it will be seen that where the inoculum is heavy the organisms have grown right across the penicillin agar, but as the number of bacteria gets smaller an increasing amount of inhibition of growth occurs. Such a picture is seen only with penicillinase-producing organisms. A bacterium, such as *Salmonella typhi*, which is resistant to penicillin but does not destroy it, when plated on a penicillin ditch-plate produces a straight line of growth which usually reaches the penicillin agar when a concentration of 10 units per ml. is used. Thus by this method some information on both the degree and the type of resistance is obtainable.

2. Swabs from many staphylococcal lesions contain a mixture of sensitive and resistant strains. In some cases before any penicillin treatment has been started the number of resistant bacteria is very small, as illustrated by Case R. C., and they may be missed by simply testing a number of individual colonies. If, however, the material is plated direct on to a penicillin ditch-plate, as few as 1 resistant to 10,000 sensitive bacteria may be detected (Fig. 2*c*), and by comparison with known mixtures some idea of the proportion of resistant to sensitive strains may be determined. Thus the bacteria in the sputum of R. C. when replated (Fig. 2*f*) showed a similar picture to a mixture of 1 part resistant to 250 parts sensitive staphylococci (Fig. 2*e*).

Summary

In studying strains of *Staph. pyogenes* isolated from 100 cases of staphylococcal infection 38 patients were found to have penicillin-resistant strains; 10 patients had a mixture of penicillin-resistant and penicillin-sensitive staphylococci.

The source of these strains and the best method for their detection are discussed.

My thanks are due to Drs. Allison and Hobbs for typing, and to Drs. Anderson and Fullerton for the primary isolation of many strains.

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ALLERGY TO PENICILLIN
WITH SYMPTOMS OF SERUM SICKNESS

BY

A. G. WILKINSON, M.D.

AND

K. ZINNEMANN, M.D.

Lecturer in Bacteriology, School of Medicine, Leeds

Toxic side-reactions and allergic symptoms following the administration of penicillin have lately attracted a good deal of attention in the U.S.A. Two papers published there dealing with this subject (Morginson, 1946; Holden, 1947) include a fairly comprehensive review of the literature. In this country Suchecki (1946) and Willcox (1946) described series of cases, and the former reviewed some of the literature. A number of single case reports have also been published in both countries, and these emphasize the variety of symptoms which may occur. One of the severest syndromes is a reaction similar to serum sickness, with some of the symptoms of anaphylactic shock. Feinberg (1944) and Rostenberg and Welch (1945), investigating the origin of this hypersensitiveness, suggest that, at least in the U.S.A., sensitization is brought about by ingestion or inhalation of *Penicillium* spores. These produce subclinical infections in approximately 5 to 6% of persons of allergic diathesis. No such data are available for this country. Feinberg's skin tests suggest that some batches of penicillin are tolerated better than others by allergic persons.

The following account of a case with severe and at times alarming symptoms is interesting for two reasons: (1) the same symptoms occurred twice, with increased severity on

the second occasion; and (2) the fact that intracutaneous sensitivity tests made it reasonably certain that the impurities in the penicillin preparations were implicated more than the penicillin in causing the symptoms.

Case History

On the night of July 24, 1945, a female patient aged 34, three weeks post partum, developed a sudden rigor. There was a painful induration and redness of the right lower quadrant of the right breast. During the next 24 hours her temperature varied between 102° and 103° F. (38.9° and 39.4° C.). From July 25 to 27 16,000 units of sodium penicillin were administered intramuscularly every three hours, together with sulphathiazole (2 g. stat., followed by 1 g. four-hourly for three days). Her temperature returned to normal within 48 hours and the local breast lesion cleared up completely within 72 hours.

Two weeks later urticarial weals appeared on the scalp. During the next five or six days there developed a massive urticaria and angioneurotic oedema of the face, trunk, and limbs, with severe pruritus. There was no rise in temperature. The patient complained of a feeling of tightness in the chest; she was very pale; the pulse was thin, with a rate of 80 to 90 a minute, her normal rate being about 60. Sitting up caused severe vertigo. Adrenaline and ephedrine were administered, but did not relieve the urticaria or the pruritus, and about 12 hours later paroxysms of tachycardia developed, with a pulse rate of 120 and upwards. Without further specific treatment the condition cleared up completely within five to six days. On account of the long interval between penicillin therapy and the onset of the allergic symptoms, penicillin was not suspected as a possible causative agent.

On Feb. 22, 1946, the patient complained of a red painful swelling in her right thumb. Within the next 12 hours the swelling increased rapidly and her temperature rose to 101.5° F. (38.6° C.). A course of 16,000 units of sodium penicillin intramuscularly at three-hourly intervals, together with sulphathiazole (2 g. stat., followed by 1 g. four-hourly), was started the next day. The first injection of penicillin into the gluteus maximus was extremely painful and the patient felt collapsed. The pulse volume was fairly good, with a frequency of 62 a minute. Recovery followed within half an hour. The penicillin injections were continued for five days without further untoward effects. The local and general condition improved rapidly, apart from a feeling of tightness in the chest on the fourth day of treatment, and after seven days the patient was quite well.

On March 5, 1946, 12 days after the start of penicillin treatment, oedema of the eyelids was noticed, and the patient complained of a general feeling of weakness. In the evening she was in a state nearing collapse, with slight rigors. The temperature was 99.6° F. (37.6° C.) and the pulse was thin and rapid. Patches of urticaria appeared on the arms and back. The next day there was a generalized giant urticaria with angioneurotic oedema. The patient was somnolent and very difficult to rouse, took no food or drink, and passed no urine during the next 24 hours. The pulse rate was 80–90.

The drowsiness persisted on the following day, and the patient had pains in the wrists and feet, which were swollen. The next day she complained of soreness and tightness of the throat, and on inspection an oedema of the fauces, and of the uvula in particular, was noticed. This passed off within 12 hours. On the fourth day the general condition had begun to improve. The oedema of the face was less, but oedema of hands and feet was still pronounced. The patient now began to take food, and there was rapid improvement during the next few days. On the ninth day she was normal except for a general feeling of weakness, which persisted about two weeks.

Eight weeks after the allergic symptoms had subsided skin-sensitivity tests were carried out to determine whether penicillin or sulphathiazole had caused the severe reaction. Patch tests and intradermal injections were the methods employed. All patch tests with solutions of penicillin (20,000 units per ml.), "soluthiazole," and physiological saline were negative.

In the intracutaneous tests the following solutions were used: (1) a commercial preparation of impure penicillin (yellow); (2) a commercial preparation of pure crystalline (white) penicillin—both in a concentration of 16,000 units per ml.; and (3) the disodium cinnamylidene dibisulphite derivative of sulphathiazole. The latter, known under the trade name of "soluthiazole," is in the form of a 45% solution, and was diluted one in five with sterile distilled water in order to obtain an isotonic solution. Quantities of 0.02 ml. of these solutions and of physiological saline as a control were injected intradermally into the upper arms, and the following reactions at the site of the injections were observed: penicillin (yellow), ++; penicillin (white), (+); soluthiazole, 0; 0.85% sodium chloride, 0.

The marked reaction to yellow impure penicillin strongly suggests that the impurities played the main part in producing the severe allergic condition, though the very weak reaction to pure crystalline penicillin also seems to implicate the penicillin as a rather mild allergen. The tests excluded sulphathiazole as a possible allergen.

Discussion

Although there are statements in the literature that renewed penicillin therapy does not necessarily produce a repetition of allergic symptoms, this case shows that the severity of the reactions may be increased considerably, and there is a possibility that each subsequent attack may tend to increase the degree of sensitivity still further. It is well to remember that there may be a considerable lag period between the administration of penicillin and the beginning of allergic manifestations. Occurrences as the one described should tend to discourage the use of penicillin in trivial infections which would clear up with the traditional conservative methods.

Willcox (1946) described the use of "benadryl" in cases with mild allergic symptoms, particularly those of urticaria after penicillin therapy. This was not freely available at the time. It remains to be seen whether severer symptoms such as the ones described in this case can be controlled effectively by antihistamine preparations.

We are indebted to Messrs. May and Baker Ltd. for a sample of "soluthiazole" and information regarding isotonic solution of the preparation; and to the Glaxo Laboratories Ltd. for a sample of white crystalline penicillin.

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CHRONIC BATTLE NEUROSIS TREATED WITH LEUCOTOMY

BY

WILLIAM SARGANT, M.B., M.R.C.P., D.P.M.

AND

C. M. STEWART, M.R.C.S., L.R.C.P.

(From the Sutton Emergency Hospital Neuropsychiatric Unit)

From the time of Dunkirk onwards various ways of using physical methods in the treatment of acute and chronic battle neuroses have been a subject of research in this unit. Sleep treatment and barbiturate abreaction (Sargant and Slater, 1940), "front-line" sedation (Sargant, 1941, 1942) and modified insulin treatment (Sargant and Craske, 1947) have now found a generally recognized place in different stages of the rehabilitation of those breaking down under battle stress. The value of these treatments emphasizes the physiological aspects of many neurotic conditions, but so far there has been no report of the use of leucotomy in this particular group. It is the purpose of this paper to report a case in which great improvement resulted after a brain operation, one of the effects of which appears to be to reduce self-perpetuating tension within the nervous system

The possible application of leucotomy to the rehabilitation of the chronic battle casualty has been held up by a natural reluctance to employ it except in the final stages of psychiatric treatment. Since 1941, however, the possibilities of leucotomy in helping various types of chronic civilian neuroses have been carefully studied. Over thirty patients have now had the operation done, either at this hospital or at the Atkinson Morley Neurosurgical Unit by Mr. W. McKissock, or at the West End Hospital for Nervous Diseases by Mr. G. Knight. Certain criteria which may help to distinguish the suitable from the unsuitable patient have gradually emerged and have finally enabled this case of chronic battle neurosis to be operated upon with a reasonable probability of success.

Case Report

The patient, a man aged 36, was admitted to the Sutton Emergency Hospital on Aug. 31, 1946. There was no history of serious neurotic or psychotic illness in the family. He was one of eight children, all considered stable, but the patient had been a more sensitive child than the rest. He had done reasonably well at school, was keen in sports, had completed a full seven-years apprenticeship as a printer, and was in regular work at this trade and in a munitions factory until he volunteered for the Army from a reserved occupation in 1942. His wife described him as happy, good-tempered, hard-working, and certainly not nervous, though still sensitive to criticism by others. He was perhaps over-particular about his personal appearance and habits, but conscientious about his work and interested in his home. Until the illness it had been a happy and successful marriage.

After preliminary training in amphibious warfare he had landed on the beach-head with the first batch of tanks on D Day. From then onwards he was in the heavy tank fighting in France, Belgium, Holland, and Germany. Many of his friends were gradually either killed or burnt to death in their tanks and the patient increasingly expected each day's fighting to be his last. "I had made up my mind that probably I was going to be killed and could not get out of it." During the investigation of possible traumatic incidents that might have caused his symptoms so many of them were found in his fighting experiences that they proved impossible to evaluate or disentangle. He managed to escape twice after his tank had received direct hits, and for some months he met battle stresses with a mounting tension and aggression but no breakdown, though he first started to feel pains in his legs at this time. Near Cologne he had received the second direct hit on his tank, which was blown open. Somehow he escaped in a dazed state and crawled to safety, with a small wound and fractured bone in his foot. He was sent back to England for treatment. When seen by his wife in hospital in November, 1944, he had obviously changed as a result of his battle experiences. He gradually became worse nervously in hospital, and was unable to face a return to duty some four months later when his foot was better, and was finally admitted to a military neurosis centre. He was discharged from the Army after some months' further treatment and was given a few shillings pension a week.

On return to civilian life he tried to resume work with his old firm as a printing-machine operator in August, 1945. He did so, but with increasingly frequent periods off work through pains in the legs, lethargy, headaches, irritability, and poor sleep. He became very sensitive to all criticism and irritable with his wife. His finances became desperate, and articles from the home had to be sold, which further increased his anxiety. When admitted to Sutton Emergency Hospital he was irritable, and begged for relief of his symptoms. He had severe headaches, fatigue, depression, and nagging pains in his legs. He was afraid of himself, was continually worrying about his war experiences, and felt that people criticized him because of his behaviour. On examination he was mildly depressed, was unable to settle at reading or any other occupation, was preoccupied with severe pain in his legs for which no organic cause could be found, was disgruntled at the treatment he had received with regard to his pension, and was worried that he would never get better. He often expressed the opinion that it would have been luckier for him to have died in battle with his friends than to live on as he was. Schizophrenic symptoms were not present, but he was mildly paranoid, hypochondriacal, and tense under a superficial display of shallow affect. Home life, previously very happy, had been near breaking-point—despite an understanding, normal, and very helpful wife—because of his irritability, sudden tendency to flare up, and perpetual preoccupation with his neurotic symptoms. He was the same in hospital—continually demanding relief of his many pains, varying in attitude between superficial appreciation and sullen criticism of all efforts to help him. He sat in the ward most of the day watching the activities of others, but unable to occupy himself at anything. Apart from compulsive rumination there were no motor acts present of an obsessional kind. His intelligence was average and his memory good.

During nine months of very intensive treatment in hospital prior to leucotomy the patient had had many hours of psychotherapy, but always seemed unable to gain insight into his symptoms. In a dozen sessions of therapeutic exploration of battle experiences, using intravenous barbiturates or ether, many traumatic incidents were gone over, accompanied by a release of great emotion, but with little effect except to relieve some of his headache. Large doses of barbiturate were necessary to help his symptoms of tension, and he gained the greatest relief when insulin sopor was given twice a day, producing a more calm, relaxed, and friendly state but no permanent change. When tension could be relieved, however, he lost the apparent shallowness of his affect, was genuinely appreciative of help, and the pains in his legs were less evident. Because the presenting symptoms might be masking an atypical depression electric convulsion treatment was also tried alone, and then combined with insulin sopor; but it worsened rather than improved his condition and had to be stopped. A final attempt was made to abreact repressed traumatic material as he came out of insulin comas specially given for the purpose, but again with no lasting success. On several occasions he was sent home for periods of leave to see if he was any better in his home environment as a further check on treatment. Before operation, and despite all the treatment given, his condition was practically unchanged except for some relief of his headaches in the frontal region. He was still repeatedly demanding relief for his various pains, and felt an increased hopelessness of ever getting better.

Before operation he was submitted to Dr. L. Minski for an independent psychiatric opinion. The comment was as follows: "My impression of this man is that he is a hysteric—he is histrionic, talks glibly of his pains, etc., and is apathetic. He is not really depressed, but is self-centred and shallow. On talking of his pension he becomes irritable and fidgety, and my impression is that he is largely a compensation neurosis. Quite frankly, I agree that psychological and ordinary physical methods of treatment are not likely to help him, but I don't know what effect leucotomy will have on him. I can find no antisocial traits in his pre-neurotic personality."

With the wife's and the patient's consent, both having been warned of the risks entailed, leucotomy was performed on June 9, 1947, by Mr. W. McKissock. There was little post-operative confusion and the patient was up and about in six days. He was, however, lethargic and careless about the ward immediately after the operation, but this rapidly improved. He reported an immediate lessening of his symptoms, and within six weeks was asking to return to work. His whole attitude had changed to one of pleasant co-operation, friendliness, and sociability with other patients and the doctors. The pains in his legs were now rarely present and did not bother him. Tension was absent. He was sent home to spend three weeks with his wife before starting work. The patient and his wife were both subjected to an intensive questioning at the end of the three-weeks trial period. The wife insisted that he was now to all intents and purposes like he had been before his illness. He had again become kind, considerate, cheerful, good-tempered, and less sensitive. No mention had been made of the pains in his legs; his tension and self-pity had gone. He was still lacking in energy, but anxious to be back at work, and rather inclined to switch his interest of the moment too quickly while waiting.

The patient's examination bore out these favourable reports, as did his whole attitude and manner. He said he felt well again, looked it, and was anxious for permission to start work immediately. He now felt quite confident about returning to his job as a printer, which had been kept open for him. There was no euphoria or elation in his attitude but a reasonable appreciation of his past illness, what had been done for him, and what he should try to do in future to keep well. At the time of writing he is back at his old job, and both his work and home life are reported as satisfactory, with an increasing restoration of his old energy. In the face of repeated questioning his wife maintains that except for his energy "he is now as I first knew him."

Intelligence has shown slight drops of 116 to 110 in Wechsler and 48 to 45 in matrix testing. Some of this small drop may be due to reduced capacity for sustained attention and transient amnesic effects of the operation, the scores in the Wechsler being reduced only in information and vocabulary subtesting. Dr. M. Desai was also asked to do Rorschach tests before and after operation, with no reference to the clinical notes or history of the patient. He made the following summary of the changes observed in tests two days before and seven weeks after the operation. "The pre-leucotomy record indicated a rigid, uncompromising attitude, with hardly any regard for practical issues. In his second record there is a very marked swing towards normality, with willingness to compromise. The suspiciousness and projected hostility, the feelings of depression, insecurity, and unsureness which prevailed in his first record have disappeared. There is a reduction in the patient's tendency to get disorganized in the face of emotional stimuli. The uncontrolled emotionality which characterized his first record is very considerably reduced, and he shows in the second record an inclination towards more adapted emotional reactions. These changes seem to be due, however, not so much to an increase in control as to a reduction in sensitivity to external stimulations. Another aspect of the tendency is the patient's greater reliance, as shown by the tests, on his own inner resources than was the case before the operation. The general trend seems, therefore, to be towards a much more normal adaptation and a greater willingness to co-operate with his environment than that found in his first record."

Discussion

The improvement of this patient has been among the most gratifying in the several thousand cases of war neurosis treated at Sutton in the past seven years Relapse at a later date cannot be excluded, but, for various reasons connected with our follow-up of other patients, it is not considered probable. Those who have been ready to predict a gross deterioration in general personality, intelligence, or social behaviour whenever leucotomy is attempted may wish to reserve judgment on the opinion of the patient's wife and the doctors treating him that such gross changes were absent. But this has also not been an uncommon finding in our civilian neuroses selected for operation. The after-effects of brain operations and of cerebral trauma in general depend a lot on the previous personality of the patient. The better it is, and the better preserved it remains up to the time of operation, the fewer have been the undesirable after-effects with leucotomy. Another possible reason for the absence of marked deterioration in many of our patients may have been the attempt to modify, so far as is possible, the severity of the operation to suit the particular patient's symptoms. For the more extensive the brain damage inflicted the more such sequelae could be expected.

In a small group of chronic schizophrenics, treated along with the much larger number of neuroses and depressions, an added deterioration has, however, often followed the operation. Schizophrenic dilapidation and disordered brain function may become more clarified and obvious. Such a dilapidation is rarely seen in the better-preserved basic personalities. Decision to operate in a particular case has become somewhat easier recently by the finding that the more loath one has been in the past to carry out the operation because of a continued preservation of general personality the better the quality of the eventual result. With its use in this type of patient it is of course necessary to have confidence, based on a long active experience in treatment, that as good a recovery by the other means now available is not to be expected.

This, however, helps to explain why some of our patients after leucotomy have been able to return to work as estate agents, clerks, housewives, calculating-machine operators, chefs, office managers, and the like after long illness and incapacity. But only one schizophrenic patient out of nine has done as well as these cases.

Certain temporary and permanent changes may be seen in all types of patient, such as lack of a former spontaneity and drive, some distractibility, a heightened irritability, a lessened capacity to worry deeply about the misfortunes of others, and the easier acceptance of imposed standards of social behaviour and morals. But not even these are consistent findings. Hebb (1945) has reported a case in which both frontal lobes were removed for traumatic scarring causing epilepsy. No deterioration due to the removal could be detected in careful mental testing some years after the operation. Such changes have not always been easy to demonstrate clinically at an even earlier stage in some of our best results. And those present are often of academic and research interest rather than practical objections to the treatment, if cases are skilfully chosen for the operation from chronically suffering and severely incapacitated patients and operative interference is not too extensive.

It has already been pointed out that the present case of chronic battle neurosis was chosen as a result of previous observations and research on civilian neuroses. The reasons were as follows. The patient was considered incurable by other known methods after nine months of intensive study and active treatment in hospital and an illness of two and a half years' duration. The family history was good, and the patient's personality before illness showed none of the traits that suggest a more doubtful result with leucotomy, such as lack of basic drive, the presence of constitutional aggressiveness, marked general psychopathic qualities, severe manic-depressive mood swings, or tendencies to hysterical or schizoid withdrawal in the face of ordinary stresses. Favourable factors were a good previous social adjustment and drive, some over-meticulousness and sensitivity, a long period of proved stress well borne before final breakdown, and the presence during the whole illness of severe tension and rumination. This tension, seeming aroused in the first place by battle experience, appeared to have finally become self-perpetuating in the nervous system, localized in intolerable hypochondriacal preoccupations, and superficially masked by hysterical, demanding, and paranoid attitudes without real insight. An important observation was that drugs which temporarily reduced tension, such as insulin and the barbiturates, helped the patient to become better integrated and to gain temporary insight and relief of symptoms. His condition was worsened by treatment that increased tension, such as convulsion therapy and wrongly directed forms of psychotherapy. Another important point was that both his home and his old job were still waiting for the patient if he recovered: the results of such treatment are often nullified by its delay till it is too late to remedy the social consequences of prolonged mental illness. There also seemed to be no real motivation to a continuance of illness if disabling symptoms could be abolished and working capacity and self-esteem restored. Such cases may be the exception rather than the rule in the average run of chronic war neuroses, but they are certainly to be found in all sections of the community and often struggling along outside ordinary psychiatric hospitals.

One further reason for reporting the case should be mentioned. The patient's wife became very alarmed, as have other relatives recently, when the operation was first suggested. This was in part because of her general practitioner's fears about leucotomy, which could have been derived from the correspondence column of the *British Medical Journal*. It is hoped, as a result of this report, that others who might benefit from this operation in the future will not lose their chance of being helped solely because of misinformed opinion or theoretical prejudice. A reasonable caution is bound to follow a careful study of actual results.

Further Note.—During proof correction the patient was again seen by one of us (C.M.S.) on November 4, 1947. He is working regularly with his old firm and his work on a printing machine is reported as satisfactory. He is still tired in the evenings and goes to bed earlier than usual. Frequency of micturition, present before the operation, is now increased. The wife reports a few minor bouts of irritability have occurred, which quickly pass; otherwise he remains thoughtful and considerate. He is again taking her to dances and resuming his old social contacts. He is normal sexually, his appetite is good, and he has gained weight.

Our thanks are due to Dr. L. Minski for providing the patients and the facilities for research at Sutton. and to colleagues at Sutton who have allowed us to examine leucotomy patients under their care.

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Medical Memoranda

An Unusual Knee Injury

The unusual nature of the following case makes it worthy of record.

CASE REPORT

A young airman was admitted to hospital complaining that he could not straighten his right knee. He said that he and a friend had been cycling along a main road, when their cycles had become locked so that they had both been thrown to the ground. On inspection there were sundry abrasions and an obvious lateral dislocation of the patella. Routine radiographs (Figs. 1 and 2) showed, much to my surprise, that there was also present a long metallic foreign body with a chisel-like edge. In view of the fact that there was no evidence of splitting of the bone it was considered that the foreign body was most probably lying in the suprapatellar pouch, and that one of the abrasions must be a partially closed wound of entry.

FIG. 1.—Radiograph showing lateral view of foreign body.

At operation unexpected difficulty was experienced in reducing the patellar dislocation. The suprapatellar pouch was empty, and on extending the incision downward the foreign body was found. Only about 1/4 in. (0.64 cm.) was projecting from the inferior surface of the medial femoral condyle. It was firmly wedged and great force was required to pull it out, when it was revealed as being 1¾ in. (4.7 cm.) of the distal end of a 1/8-in. (0.3-cm.) screwdriver.

The patient made a good recovery. Radiographs taken five weeks after the operation showed no irregularity of the articular cartilage. He was given faradism and after six weeks was discharged to an R.A.F. hospital, with no free fluid, and with full extension and active flexion to 80 degrees. A fortnight later he returned to his unit on light duties.

COMMENT

To explain the presence of the screwdriver I had to suppose that the piece had been lying in the road and had been knocked up into a vertical position by the falling cycle and had been in this position when the patient's knee fell on it. This rather far-fetched theory held the field till the friend, who had been told of the findings, arrived with the rest of the screwdriver, which he had found in the tool-bag of his cycle in the condition shown in Fig. 3. Presumably the point of the screwdriver had come out through the tool-bag flap in the fall, entered the femur, and got broken off, the rest of the screwdriver having fallen back into the tool-bag. The screwdriver was of poor quality, and the break was a fatigue fracture at the point of torsion.

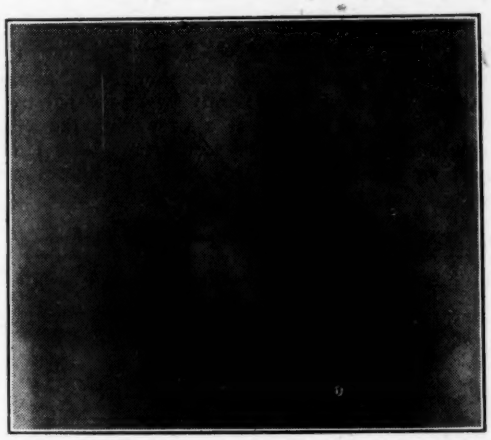

FIG. 2.—The foreign body from another aspect.

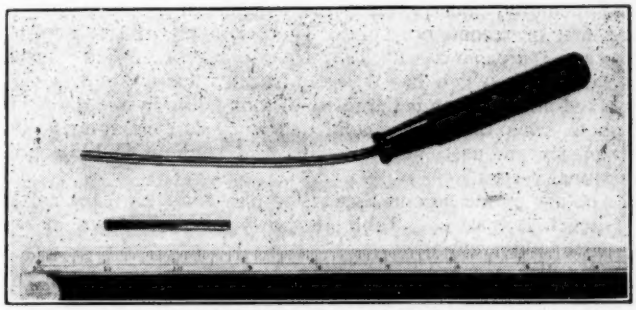

FIG. 3.—The broken screwdriver.

The mechanism of the accident has been explained, but the absence of even a small split in the femur from an instrument which had penetrated a distance of 1½ in. (3.8 cm.) and was so well adapted for shearing off the entire condyle is rather surprising. Perhaps the fact that the screwdriver entered slightly across the grain, coupled with the sudden breaking of its shaft, is the explanation.

I am indebted to Mr Lloyd, radiographer to the hospital, for the *x*-ray prints; to Mr. Beven, of Messrs. Baker Perkins, Ltd., for the opinion on the screwdriver fracture, and to Mr. Guscott, of the same firm, for the photograph.

WM. MARSHALL, M.B., Ch.B.,
Surgeon in charge of Service Fractures,
Peterborough and District Memorial Hospital.

Two Mongol Children in a Family

The rarity of the occurrence of two mongol children in the same family is sufficient warrant for putting any case on record. Brousseau in his monograph on mongolism quotes Goddard as stating that in an experience of 322 cases he had never met with more than one affected child in a family, nor had Schlapp, working among the mental defectives in New York. My own experience in more than 200 cases has been similar.

In the present instance both parents were strong and robust dalesfolk, and at the birth of the first child—a boy now 9 years of age—the father was 32, the mother 21. The second child, a girl, was born fourteen months later. There have been no subsequent pregnancies. Both babies were breast-fed, and both

show the typical physical and mental characteristics of mongolism but no other abnormalities, and the tongues are not fissured. Both have hyper-extensibility of the thumbs and both adopt the Buddha position when sitting on the floor. They show medium-grade imbecility and, as is always the case, are fond of music and keep themselves clean and tidy.

COMMENTARY

The statement frequently made that the mongol most usually appears at the end of a large family when the parents are no longer young and the mother is approaching the climacteric requires modification, as may be seen from Table I, compiled from my own completed records and the figures given by Brousseau:

TABLE I.—*Position of Mongol Child in Family*

Order of Birth	Present Author (154 Cases) %	Brousseau (772 Cases) %
1st	23·3	25·2
2nd	23·3	19·8
3rd	10·4	13·5
4th	8·5	7·9
5th	8·5	6·5
6th	7·8	6·6
7th	7·8	6·7
8th	2·6	5·6
9th	2·6	5·3
10th	5·2	2·9

Thus 57% (58.5% according to Brousseau) of mongols occurred in the first three pregnancies, and in the greater number the parents appear to be perfectly normal physically and mentally. Benda found 124 mongols in 255 to belong to the first or second pregnancy. There is a progressive drop in successive pregnancies until the tenth is reached, when there is a small rise, which has little statistical value. Another very marked phenomenon is the rarity of mongolism in contradistinction to other forms of mental deficiency, and its comparative frequency amongst the more able and studious and the professional classes.

The age of the parents appears to play some part, the nature of which is obscure. Table II shows the percentages in two series of observations.

TABLE II.—*Parents' Ages at Time of Birth of a Mongol Child*

Age	Fathers %		Mothers %	
	Present Author	Brousseau	Present Author	Brousseau
Under 30	20·2	19·2	18·1	27·1
31–35	7·2	20·8	13·6	15·3
36–40	23·2	21·6	30·1	26·3
41–50	49·3	38·4	37·9	31·3
Total cases included	154	412	—	582

In his recent book, *Mongolism and Cretinism*, London, 1947, Benda states that 42% of the mothers were under 35, and quotes Beidleman as finding an identical percentage.

G. A. AUDEN, M.D., Ph.D., F.R.C.P.

Angioneurotic Oedema as a Possible Sequel to Penicillin Administration

Angioneurotic oedema is rare enough to warrant attention, and the following case is of special interest in view of the possible aetiological connexion between the symptoms exhibited and the administration of penicillin.

CASE REPORT

A young woman who had been very seriously ill with septicaemia in a London County Council general hospital was admitted here early in June, 1947, for rehabilitation. Her general condition, considering the severity of the illness, was surprisingly good—a fact we attributed to the large amount of penicillin she had received (15,840,000 units).

Progress was somewhat slow but, nevertheless, uninterrupted until on the evening of the twelfth day after admission she complained of severe pain in the right side of her neck. The temperature rose to 102°–103° F. (38.9°–39.4° C.), and a swelling began to develop below the styloid process. Penicillin in doses of 50,000 units four-hourly was immediately started. By next day the swelling had greatly increased, and extended down the whole length of the sterno-mastoid muscle. Fluctuation was present and, although other cardinal symptoms of inflammation were absent, it was decided, in view of her previous history, to incise. A thorough exploration was made under thiopentone, but no pus was found. On the other hand the tissues were oedematous, especially the sterno-mastoid muscle, which was swollen to three times its normal size, and the subsequent dressings were wet with serum. Three days later everything had subsided and penicillin was discontinued. A tentative diagnosis of angioneurotic oedema, supported by a completely normal blood count, was made. The white cells numbered 6,000 per c.mm.

On the eighteenth day the temperature again rose abruptly to 103° F., and a painful fluctuating swelling developed over the supinator muscles below the right elbow. This rapidly increased in size to that of a large duck's egg. In view of the previous experience it was left severely alone, only ephedrine in 1/2-gr. (32-mg.) doses three times a day being given. Three days later the swelling had disappeared and the temperature had returned to normal. The blood count was normal except for a slight reduction in platelets to 200,000 per c.mm.

A quiescent period followed, but on the nineteenth day from the resumption of penicillin therapy the temperature again rose and the patient developed a cough with frothy, watery sputum. Beyond slight catarrhal changes no physical signs could be detected, and x-ray examination revealed no abnormality. These symptoms again lasted for three days and were followed by acute abdominal pain in the right iliac fossa. This presented a difficult problem, as the maximum tenderness was exactly over McBurney's point, and with a temperature of 100° F. (37.8° C.) and a pulse of 98 there seemed little doubt but that the appendix, too, was oedematous. Fortunately for all concerned these symptoms subsided rapidly and the pain shifted to the left epigastric region and the left costal margin. The spleen was just palpable. Three days later the epigastric pain became intense and vomiting was frequent. Fluids were returned blood-stained, suggesting oedema and congestion of the gastric mucosa. Once again these symptoms persisted for three days.

During the whole of this period it was noted, especially by the nursing staff, that from time to time the patient became somewhat eccentric and irrational for short periods—symptoms which might point to small oedematous lesions in the brain. The condition now appeared to have burned itself out and there were no recurrences.

Other pathological investigations showed: a sedimentation rate increased to 13 mm. in the first hour, a clotting time slightly up at thirteen and a half minutes, and a bleeding time within normal limits at four minutes.

It will be noted that there were two separate attacks with an interval of ten days between. While it is impossible to dogmatize, the absence of any other aetiological factors and the fact that before each attack penicillin had been administered in large doses at least render it suspect as the causal factor. The patient had never suffered from such a condition before and there was nothing in her history even to suggest an allergic diathesis. Another curious feature was the site of election in each attack. During the first the skeletal musculature was singled out, while in the second the visceral and internal organs were involved.

J. OWEN REID, M.D.,
Medical Superintendent, Princess Mary's Hospital, Margate.

Mr. L. Z. Cosin spoke on "Modern Methods in the Care of the Aged" at the Royal Institute of Public Health and Hygiene on Nov. 19. Mr. W. E. Tanner was in the chair. Mr. Cosin said that the aged population of Great Britain had risen from 2½ million (1901) to nearly 6½ million (1944) in about 40 years, while the Beveridge Report anticipated a further rise to 9½ million of pensionable age by 1971. The problem became more serious when they found that the number of invalids per 1,000 population rose steeply after the age of 60. More adequate treatment for the aged sick required a different type of organization for their especial needs; this had been referred to in the recently published Report of the British Medical Association on the care of the aged sick. This postulated the provision of geriatric departments in each district hospital of the Regional Hospital Boards. Pilot units in this country were working on these lines, and the results had been very gratifying. Patients could be transferred to appropriate long-stay annexes only when it was considered that maximum improvement had been attained. Thus there would be long-stay annexes for the fully ambulant, for the permanently bed-fast, for the senile confusional states, and for those patients whose needs were largely residential and nutritional. The most important specialists in a geriatric department were, first, a general physician experienced in the diagnosis and treatment of aged patients; secondly, a psychiatrist. It was unfortunate that the psychological difficulties of the senile were so little appreciated, because many of the senile confusional states rapidly responded to treatment.

Reviews

MONGOL AND CRETIN

Mongolism and Cretinism. By Clemens E. Benda, M.D. (Pp. 310; 101 illustrations. 25s.) London: William Heinemann, Ltd. 1947.

Among the many problems associated with mental deficiency there are none so interesting as those which concern that type known as mongolism. The physical and psychological manifestations give a picture so uniform, and its prevalence irrespective of nationality is so evident, that it is no cause for surprise that various theories of its aetiology have been suggested without being founded on fact—for example, racial regression, hereditary factors, syphilitic taint, and fertility exhaustion. Sporadic cretinism on the other hand, which is in some ways comparable, has a simpler aetiology, and its pathology is now well understood.

Dr. Clemens E. Benda, utilizing his unique opportunity as Director of the Wallace Research Laboratory at the great institution of Wrentham, Mass., has made a comparative study of these two forms of mental deficiency and has published his results in a book of the first importance. It has been estimated that mongol defectives form about 5% of the mentally deficient of all groups. Benda quotes Beidleman that mongolism occurred in 3.4 per 1,000 births at a large maternity hospital. Considering that to be an average sample of children born in the U.S.A. he calculates that between 6,000 and 9,000 mongols are born every year, and that, if their expectation of life is assumed to be ten years, at any given time there will be some 60,000 mongols in the population. The statistical surveys reveal other facts—notably the great rarity with which the condition occurs in more than one child in the family. Benda, who found two such cases in 400 families, quotes Orel as having collected 21 cases in the literature. Parents of a mongol are always fearful lest they may have a second, a point on which they can be reassured. The statement that mongolism occurs most frequently in a large family (when the mother is nearing the climacteric) is not altogether borne out by the figures. Thus both Benda and Beidleman found 42% of mothers to be under 35 years of age. In a series of 255 mongol births the former found 124 (48.6%) to be the first or second child, Brousseau (772 mongols) gives 45%, and in another smaller series the percentage was 46.6%.

Valuable as they are, these dry bones of statistical enumeration are but a scaffold round the main thesis—the pathological and histological investigations which form the chief part of the book. The author discusses each endocrine gland in turn and illustrates them by beautifully reproduced photomicrographs. He concludes that mongolism is a congenital hypopituitarism. The format and illustrations are remarkably good, and the book is likely to remain for a long time the standard work on mongolism.

G. A. AUDEN.

NOTHING BY MOUTH

Parenteral Alimentation in Surgery with Special Reference to Proteins and Amino Acids. By Robert Elman, M.D. (Pp. 284; illustrated. 21s.) London: Hamish Hamilton Medical Books. 1947.

Until recently the results of progress made in the development of surgical procedures were impaired by the frequency of infection, collapse, or shock after operation, but advances in chemotherapy and transfusion techniques have now improved the situation. Blood transfusion is a form of parenteral alimentation as well as a means of rectifying the physiological imbalance due to oligaemia. Many types of fluid and food are used for parenteral alimentation. By this means, when the patient is unable to ingest, digest, or absorb sufficient food, it is possible to give essential nutrients—water, electrolytes, amino-acids, carbohydrates, and vitamins. Fat is not generally administered parenterally, since there is no stable emulsion that can be safely introduced into the circulation. In future intravenous fat will most probably become available as a means of giving much of the calorie requirements parenterally. It should be noted, however, that there has been a tendency to resort to parenteral alimentation in certain conditions which do not justify this procedure.

In this monograph, which was awarded the quinquennial Samuel D. Gross Prize of the Philadelphia Academy of Surgery for 1945, Elman gives a full account of the development and use of the various forms of parenteral alimentation. We welcome this account from the pen of one of the leading exponents of this method of feeding. As he points out, discussion of this mode of treatment is as appropriate to medical as to surgical patients. He pays special attention to protein and amino-acids, for he has had great experience of them.

In his introduction the author gives a most interesting history of the development of transfusion techniques. He credits Sir Christopher Wren with being the first person to introduce fluids intravenously. He then describes the general indications for and method of parenteral administration of fluids, with an adequate consideration of the factors leading to untoward reactions. There follow discussions on the requirements for water and electrolyte, energy-yielding nutrients, and vitamins. In the remaining two-thirds of the book he considers the protein needs of the body, protein deficiency, and the methods of parenteral protein administration, including the transfusion of plasma, amino-acids, and hydrolysed protein. In the penultimate chapter he sets out a practical programme for parenteral alimentation, and finally he reviews the clinical results. A historical appendix summarizes the salient data in the development of this mode of alimentation, and there is a useful author–subject index.

D. P. CUTHBERTSON.

LEPROSY

A Practical Textbook of Leprosy. By R. G. Cochrane, M.D., Ch.B., F.R.C.P., D.T.M.&H. With foreword by George R. McRoberts, M.D., F.R.C.P., D.T.M.&H. Oxford Medical Publications. (Pp. 283; illustrated. 42s.) London: Geoffrey Cumberlege, Oxford University Press. 1947.

It has been calculated that there are about 1,200,000 people in India suffering from leprosy, and Dr. Cochrane says, "It is probably not an exaggeration to state that there may be as many as 300,000 cases of leprosy in the Madras Presidency alone." This statement itself is sufficient to justify the writing of a book discussing particularly leprosy as it is found in Madras. Dr. Cochrane writes from long experience, and the 22 chapters of his book are a rich mine of information on every aspect of the subject, though some of the seams may be rather hard to excavate. The 174 illustrations are excellent—photographs of lesions, photomicrographs of sections, pictures of buildings and rural scenes, and two coloured representations of *Myco. leprae* in the tissues. These, even apart from the text, form an atlas of leprosy sufficient to make the book well worth studying.

The author deals with every feature of leprosy and gives a wealth of practical detail—perhaps most fully in the epidemiological and preventive aspects, and all who survey the problem or combat the disease should study these sections carefully. He fully discusses treatment with hydnocarpus oil, as well as the treatment of lepra reaction, neuritis, and other complications, but refers to the more recent sulphone therapy only in a few sentences. He adds a paragraph on the requirements for testing new remedies, which include facilities for histological work and a person capable of interpreting the sections. "If everyone would avoid publishing the results of treatment for two years much disappointment would be avoided."

The book unfortunately has some textual mistakes, and there are a few statements which have to be interpreted not as they read but in the light of the context. These defects are doubtless due to the author's absence in India making it difficult sufficiently to correct the proofs.

E. MUIR.

BONE-MARROW CULTURE

La Cultura in Vitro del Midollo Osseo. By Aminta Fieschi and Giovanni Astaldi. (Pp. 309; illustrated. 1,000 lire.) Pavia: Tipografia del Libro. 1946.

In nine years of research into the application of tissue-culture methods to the problems of haematology Fieschi and Astaldi have accumulated much useful information, which they have summarized and reviewed in this book on bone-marrow culture.

They are not concerned with studies of cell metabolism, and for morphological studies they use a relatively simple technique. Bone marrow obtained by sternal puncture is transferred to a 4:1 mixture of plasma and chick-embryo extract. After this has coagulated, the culture is covered by a similar fluid medium prepared from serum, which has to be renewed every one or two days. For direct observation and for the preparation of smears the solid part of the culture may be made on coverslips. The authors find the principal evidence for most of their interpretations in stained smears, and their successful results, illustrated in good photomicrographs and coloured plates, will make many wish to try their methods. They briefly consider other work on the subject and their own results with normal marrow in terms of Ferrata's theories of haemopoiesis, and then discuss in full their findings in pernicious anaemia, the leukaemias, and erythroblastic anaemia.

The book is interesting in spite of many repetitions and lengthy discussions, and some of the conclusions are remarkable. The marrow cells in cases of relapsed pernicious anaemia tend to mature normally in culture. In marrow taken immediately after beginning liver therapy basophil megaloblasts undergo early normoblastic maturation. Cells in cultures from cases of chronic leukaemia survive only as long as their normal counterparts, while those from cases of acute leukaemia can survive to a time when normally the parenchymatous tissue has been replaced by fibroblasts and macrophages—a difference connected with the relation of the leukaemias to malignant growths. The authors promise further investigation into this and other problems. Meanwhile they have produced a stimulating and well-documented work which many haematologists will wish to have in their library.

L. P. R. FOURMAN.

SKIN DISEASES

The 1946 Year Book of Dermatology and Syphilology. Edited by Marion B. Sulzberger, M.D.; Assistant Editor, Rudolf L. Baer, M.D. (Pp. 638; illustrated. $3.75 or 21s.) Chicago: The Year Book Publishers. London, H. K. Lewis and Co. 1947.

The indefatigable editors of this series have produced another very useful summary of a year's dermatological progress. As usual, they begin their volume with an article of some length on a topic of interest to both dermatologists and general physicians; and this year they discuss advances in management, drawing attention to several new remedies of great interest. Within the last few years a number of promising new drugs have been discovered, such as the sulphonamides, penicillin, tyrothricin, streptomycin, and the quinolines, and the editors carefully consider their advantages and disadvantages, their indications and contraindications. They also discuss the recent antihistamine drugs and—perhaps the most striking recent advance in skin therapy—the treatment of lupus by large doses of calciferol. It is impossible to summarize their remarks on all these matters here, but their attitude throughout is well balanced. After a formidable table of the dermatological dangers of penicillin they conclude that, "although valuable in exceptional cases, penicillin is *not* particularly valuable as a *topical* medicament for *general use* against bacterial infections of the skin." Medical men in Britain might bear this admonition in mind, for some now treat almost every skin case with penicillin cream as a routine, sometimes with deplorable results.

In addition to the introductory essay the *Year Book* presents most of its familiar features, including good abstracts of the dermatological literature of the year. Probably every important paper is mentioned, and the illustrations are well chosen and well reproduced. The "Quiz" on the jacket will reveal to many readers how numerous are the questions on recent dermatological work that they cannot answer, and, it is to be hoped, will prompt them to fill the gaps in their knowledge. We again recommend this book.

H. HALDIN-DAVIS.

Transactions of the American Therapeutic Society, Volume XLIII, 1943, edited by Francis M. Pottenger, jun., and published by the Society, contains the papers given at the Society's 44th and 45th annual meetings. Of most of them it can be said, in the words of one of the authors, "These observations are not original, but they are personal." They will therefore be of more interest to those who attended the meetings, and may wish to have some permanent reminder of what was said, than to the general medical public.

BOOKS RECEIVED

[Review is not precluded by notice here of books recently received]

The Kingdom of the Lost. By J. A. Howard Ogdon. (Pp 256. 10s. 6d.) London: The Bodley Head. 1947.

The author describes his recovery from schizophrenia with the aid of yoga.

Recent Advances in Sex and Reproductive Physiology. By J. M. Robson, M.D., D.Sc., F.R.S.Ed. 3rd ed. (Pp. 336. 21s.) London: J. and A. Churchill. 1947.

A summarized account of recently acquired knowledge of the reproductive system.

A Short Textbook of Surgery. By C. F. W. Illingworth, C.B.E., M.D., Ch.M., F.R.C.S.Ed. 4th ed. (Pp. 680. 30s.) London: J. and A. Churchill. 1947.

Includes new material on anticoagulants, thiouracil, protein hydrolysates, arterial injuries, and nerve injuries.

The Occasion Fleeting. By Hugh Barber, F.R.C.P. (Pp. 199. 15s.) London: H. K. Lewis. 1947.

Essays on the art of medicine.

The Parathyroid Glands and Skeleton in Renal Disease. By J. R. Gilmour, M.R.C.P. (Pp. 157. 18s.) London: Oxford University Press. Geoffrey Cumberlege. 1947.

An account of the parathyroid gland in 90 cases of renal disease.

The Treatment of Rheumatism in General Practice. By W. S. C. Copeman, O.B.E., M.A., M.D., F.R.C.P. 4th ed. (Pp. 258. 12s. 6d.) London: Edward Arnold and Co. 1946.

An account of acute and chronic rheumatic disorders and their treatment; for the general practitioner.

Clinical Studies in Psychopathology. By H. V. Dicks, M.A., M.D., M.R.C.P. 2nd ed. (Pp. 238. 15s.) London: Edward Arnold and Co. 1947.

Intended for the practitioner with clinical experience of the psychoneuroses.

The Child's Lung. By Stefan Engel, M.D. (Pp. 332. 40s.) London: Edward Arnold and Co. 1947.

An account of the structure, function, and diseases of the lung in children.

An Atlas of Dental Histology. By E. B. Manley, M.Sc., B.C.S., B.D.S., and E. B. Brain, F.I.B.P., F.R.P.S. (Pp. 49. 12s. 6d.) Oxford: Blackwell Scientific Publications. 1947.

Presents photomicrographs of dental tissues, and includes a section on histological technique.

The Shakespeare Circle. By C. Martin Mitchell. (Pp. 116. 12s. 6d.) Birmingham: Cornish Brothers, Limited. 1947.

A biography of Dr. John Hall, Shakespeare's son-in-law.

National Insurance. By John Gazdar, LL.B. (Pp. 74. 3s.) London: Stevens and Sons, Ltd. 1947.

A simply written account of the effects of the National Insurance Act, 1946.

Die Klinik der energetisch-dynamischen Herzinsuffizienz. By Robert Hegglin. (Pp. 120. 19 Swiss francs.) Basle and New York: S. Karger. 1947.

A monograph on cardiac insufficiency in metabolic disorders.

The Epidemiological Significance of Grouping and Typing the Haemolytic Streptococci. By Jörgen Ernst. (Pp. 379. 25 Danish crowns.) Copenhagen: Ejnar Munksgaard. London: Humphrey Milford, Oxford University Press. 1942.

The author discusses particularly scarlet-fever epidemics and endemics.

Introduzione allo Studio dei Protozoi Parassiti dell' Uomo. By Augusto Corradetti. (Pp. 100. No price.) Rome: Istituto Superiore di Sanità. 1947.

Includes the study of entamoebae, trichomonads, trypanosomes, and plasmodia.

La Science de L'Hypnotisme. By E. Bérillon. (Pp. 378. 160 francs.) Paris: Librairie Jouve et Cie. 1946.

The use of hypnotism in psychotherapy.

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FOR AND AGAINST B.C.G.

We have referred editorially on several occasions during the past few years to the possibility of using B.C.G. vaccine in this country. It is now twenty-five years since it was first used in France: in other countries, notably Denmark, Norway, and Sweden, the method of employing it has been improved, and careful studies have been made which appear to afford sound evidence of its value. A considerable body of opinion among those interested in the treatment of tuberculosis in this country is in favour of the method, and recently an influential deputation requested the Minister of Health to sanction the use of the vaccine and to make it available. It is understood that the possibility of acceding to this request is being explored. Presumably the vaccine could be obtained from abroad until arrangements can be made for its manufacture here.

In a paper read to the International Congress of Physicians in London on Sept. 12, which we publish on page 855, Prof. G. S. Wilson takes, as he describes it, the part of devil's advocate, and marshals the arguments against the use of B.C.G., in order at least that we may be quite clear about what we are doing if it is to be introduced. He first criticizes the statistical evidence of its efficacy. It is generally admitted that the original observations in France mean very little; they were also based largely on oral administration, which has now been abandoned in favour of some form of injection. Among studies employing present-day methods that of Wallgren is vitiated by the absence of controls and that of Levine and Sackett in New York by a faulty method of selecting controls, while that of Rosenthal and his colleagues in Chicago affords incomplete information in several particulars. All these workers used the vaccine in infants. Among those who have given it to nurses Ferguson had no controls, and Heimbeck, whose work in Norway is generally considered to provide the surest backing for B.C.G. as a prophylactic, employs a method of presenting his results which involves a fallacy. Finally, although Aronson and Palmer's results among North American Indians are acknowledged to be very suggestive, it is pointed out that effects observed in so highly susceptible a race will not necessarily be duplicated in white peoples possessing a higher degree of basic immunity. Lest these well-founded criticisms should have an unduly deterrent effect, it is perhaps as well to remember that Wilson is deliberately arguing from the negative standpoint, and that a more difficult subject on which to produce statistically unassailable evidence is scarcely conceivable. The disease being one of low incidence and extreme chronicity, large numbers of persons must be observed for a period of years. We should also not forget that in the more manageable experimental field the immunizing power of B.C.G. has been well demonstrated; moreover, in the human subject present-day methods of using it induce tuberculin-sensitiveness regularly. It may not be justifiable to transfer without qualification to ourselves conclusions based on effects in guinea-pigs, calves, or even American Indians, but at least the theory is sound and there is some expectation of the desired effect.

Everyone will agree with Wilson that if we are to use B.C.G. its first use should take the form of a properly controlled further investigation rather than the liberation of the vaccine for anyone to do what he likes with it. It is an important point that untoward effects from the vaccine in infants might easily prejudice subsequent immunization against diphtheria. Whatever method is employed, the effects of a living vaccine are always liable to take a form which will excite public animosity. B.C.G. injected subcutaneously gives rise to an abscess in a small proportion of cases; intracutaneous injection may result in an ulcer; and the multiple-puncture method, though rarely causing a destructive lesion, produces up to forty rather angry-looking red papules which persist for weeks. Care in the maintenance of the culture will ensure that untoward effects are rare, but they cannot entirely be eliminated. In the preparation of the vaccine a nice balance has to be struck between a degree of avirulence which renders it ineffective and an approach towards virulence which leads to the production of local lesions. An interesting account is given by K. A. Jensen[1] of the behaviour of B.C.G. at the State Serum Institute, Copenhagen, where he was responsible for preparing the vaccine for use in Denmark between 1927 and 1941. Two strains were used during that time, of which one was not sufficiently avirulent and had to be abandoned. The condition of the other could be kept fairly constant by interposing a few transfers on bile-potato medium after a series of generations on the Sauton medium employed for making the vaccine. Jensen has also devised an accurate method of assessing virulence, which consists in injecting four different doses intradermally into guinea-pigs and observing the exact duration of each nodule produced. One can well understand his reluctance, expressed at the International Congress for Microbiology last summer, to embark on the use of an alternative vaccine made from Wells's vole bacillus. His attitude was that, having spent twenty years in learning how to manage B.C.G., he had no wish to start again from the beginning. It should perhaps be added that the vole bacillus might well prove not to need so much managing.

That B.C.G. vaccination has disadvantages there is no denying, and everyone will demand with Wilson that the gains from it shall be commensurate. Where everyone will not follow him is when he seems to suggest that the need for a method of immunization against tuberculosis has been exaggerated. He mentions the fact that during the whole of the Prophit survey only two nurses under observation died of tuberculosis, "giving an annual mortality rate one-third of that for the female population of corresponding age in England and Wales." This isolated fact is misleading. It is generally conceded that nurses more often develop tuberculosis than comparable women in other occupations, and if our information refers only to morbidity and not to mortality it is because a follow-up

[1] *Acta tuberk. scand.*, 1946, **20**, 1.

which will yield information on the latter has yet to be made. Authors adducing evidence of a high incidence of tuberculosis among nurses are Heimbeck[2] himself, E. L. Ross,[3] H. L. Israel *et al.*,[4] and D. W. Carmalt-Jones[5]: the last-named includes a comparison with female students of other subjects at the same age. The findings in the Prophit survey[6] deserve to be given more fully. The number of nurses on which conclusions are based was 2,572, and they were under observation for an average period of 2.8 years. They presumably included some who were first examined when the survey began in 1934, and had thus been observed for 8 years up to 1942, at which point for this purpose the survey terminated. They must also have included many observed for much shorter periods, and, too, some who were untraced and whose fate, if known, might have added to the number of those with tuberculosis. The number initially Mantoux-negative was 452, and of these no fewer than 33 (7%) developed clinical tuberculosis. It is true that only 2 of these nurses had died when the report was written, but 2 had spinal caries, 1 advanced tuberculous laryngitis, and 4 others active pulmonary disease; in the remainder the lesion was stated to be "arrested," "quiescent," "healed," or "recovered," but any such description can be only provisional in this disease. Of the originally Mantoux-positive 2,120 nurses only 43—a much lower proportion—had developed tuberculosis; the disease was still active in 14 and "quiescent" in 19. If the number of deaths in this series could be stated ten or even twenty years hence the picture would be very different: tuberculosis is a disease which takes a long time to kill. For the same reason the fact that only 1 child in 1,740 dies of tuberculosis in the first year of life does not present a true picture of the mortality from infection acquired at this time.

We would therefore question the conclusion that there is not enough to be gained by the use of B.C.G. even if its efficacy is proven. Any feasible method that will demonstrably increase resistance to tuberculosis in certain classes of person is surely well worth while. These classes certainly include tuberculin-negative nurses, and infants in infected households. It is possible, as Wilson suggests, that to aim at protection from undue exposure to infection would be a better policy, but this is even more difficult than it sounds: one of the chief dangers to nurses is the undiagnosed case, sometimes in a surgical ward. There is a field of usefulness for B.C.G. if the claims made for it are accepted. It seems a reasonable view that some contribution from this country to the study of this subject is overdue.

THE WANING POWER OF PENICILLIN

It has been a general experience for some time past that penicillin-resistant staphylococci are encountered with increasing frequency. Almost unheard-of in the early days of penicillin treatment, they now form a substantial proportion of strains from patients for whom such treatment is contemplated, and usually cause it to fail. The magnitude of this unwelcome change will be appreciated from the careful observations of Dr. Mary Barber, published in this issue of the *Journal* (p. 863). Of two hundred strains cultivated from patients at the Hammersmith Hospital during 1946, 12.5% were penicillin-resistant, or 14.1% if only those are considered which were derived from actual lesions. During the first half of 1947, only strains from actual lesions were tested, and in one hundred such the number found to be resistant was no less than thirty-eight. The main interest of these observations is their bearing on the future efficacy of penicillin treatment, but they involve two other matters with which this paper chiefly deals. One is the method used for testing sensitivity, and in this connexion it is perhaps not generally understood that when an organism forms penicillinase quite misleading results may be obtained by certain conventional methods if the size of the inoculum is not controlled. Fortunately a very fair picture of the true state of affairs can be obtained by applying the diffusion principle in primary culture, whether by the "ditch" method, as illustrated here, or by the use of "cups" in which solutions of different strengths are placed.

The second and more fundamental aspect of the subject with which Dr. Barber's paper deals is the origin of resistant strains. There is now a considerable literature dealing with the question whether the acquisition of penicillin-resistance in bacteria generally is the result of selection or of mutation. As it concerns staphylococci any answer to this question must take account of the fact that there are two quite distinct types of resistance. This was first pointed out by W. W. Spink and Viola Ferris,[1] who observed that whereas staphylococci artificially habituated to penicillin *in vitro* rapidly lost this property on transfer to normal media, and did not owe it to forming any inactivating substance, naturally resistant strains or those apparently acquiring resistance *in vivo* were permanently resistant, and contained a substance which was a potent inactivator of penicillin. That this substance is in fact penicillinase was shown by A. Bondi and Catherine C. Dietz.[2] Others who were early in recognizing this important distinction were J. E. Blair *et al*,[3] and E. A. North and R. Christie,[4] who also demonstrated that naturally acquired resistance is accompanied by no loss of pathogenicity, whereas organisms artificially rendered resistant lose this property. These authors also claim to have shown in one patient that a highly resistant staphylococcus recovered after penicillin treatment was identical serologically and in every other property with the more sensitive strain isolated a fortnight earlier. This observation favours the mutation hypothesis, and is in conflict with the interesting finding reported in the present paper that sensitive and resistant organisms derived from the same patient, the former predominating before treatment and the latter entirely replacing them after it, were distinct both serologically and by phage typing. It is evidently desirable that further observations on these lines should be made, but common sense appears to favour the view held by Dr. Barber. There is no reason why two quite distinct types of resistance should result from habituation to penicillin, one in a test-tube and the other in the body, nor is the capacity

[2] *Arch. intern. Med.*, 1928, **41**, 336; 1931, **47**, 901.
[3] *Canad. med. Ass. J.*, 1930, **22**, 347.
[4] *J. Amer. med. Ass.*, 1941, **117**, 839.
[5] *Tubercle*, 1933, **15**, 59.
[6] Daniels, M., *Lancet*, 1944, **2**, 165, 201.

[1] *Science*, 1945, Aug. 31, 221.
[2] *Proc. Soc. exper. Biol. Med.*, 1945, **60**, 55.
[3] *J. Immunol.*, 1946 **52**, 281.
[4] *Med. J. Austral.*, 1946, Feb. 9, 176.

to form penicillinase a property likely to be acquired in such a way. The best explanation of the facts is that penicillinase-producers are naturally resistant, and from very small beginnings are rapidly coming to occupy the places left vacant by their more vulnerable cousins.

The meaning of this for the future of penicillin treatment needs little emphasis. It is a problem not peculiar to staphylococcal infection, although more serious in relation to this than to any other. The capacity of staphylococci to acquire resistance, at least artificially *in vitro*, is very great; whether naturally resistant strains reach the same levels, or can increase their form of resistance in response to the same stimulus, is not clear. But in so far as *in vitro* behaviour is any guide, the findings of E. W. Todd and his colleagues[5] are of interest: whereas the resistance of *Staph. aureus* could be raised 3,000-fold (and others have since exceeded this figure) that of a pneumococcus could be raised only 27-fold and of *Strep. pyogenes* 5-fold. Thus we have less to fear from the latter at all events, but in view of its much greater sulphonamide sensitivity we may well wish that the two could change places in the matter of their long-term reaction to penicillin. It is for its power over grave staphylococcal infections that we have always had most reason to be grateful for the discovery of penicillin, and that power is already well on the wane. We must indeed look to a future in which the problem of treating these infections has almost to be faced afresh. Streptomycin is unlikely to do more than help to bridge a short gap between penicillin and some new form of chemotherapy: there are already abundant records to show that staphylococci, like other species, may acquire immense resistance to this antibiotic within a very short time. There is little that can be done to delay the time when a majority of staphylococcal infections will be resistant, at least to a dangerous degree, to treatment with penicillin. The correct policy is to test the sensitivity of the organism in each case, and to give from the first a dose which should be adequate to control it. This is not universally feasible, but another useful measure within the capacity of every practitioner is to restrict the use of penicillin to cases in which there are clear indications for it. The present enormous consumption of the drug can be accounted for only by a good deal of indiscriminate use, and it is generally considered that widespread use, particularly of inadequate doses, is a potent factor in breeding resistant strains of bacteria.

RELIEF OF PAIN IN PELVIC CANCER

Incurable cancer of the pelvic organs, both male and female, is seen so frequently that it is surprising that more attention has not been paid to measures for relieving the distressing pain which usually marks its terminal stages. Greenhill and Meave Kenny, in articles elsewhere in this issue of the *Journal*, both point out that the usual treatment with ever-increasing doses of opiates has serious disadvantages in that it causes mental as well as physical deterioration and makes the patients' last days a trial both to themselves and to their attendants. The problem as it applies particularly to carcinoma of the cervix was fully discussed in 1937 in an important article by T. F. Todd,[6] who described in detail the technique, indications, and limitations of pre-sacral neurectomy and intrathecal injection of alcohol—procedures which had been introduced several years earlier. However, it is probably true that they have not been used as often as they should, and Greenhill's reminder of their value is timely.

Todd emphasized that if renal pain is excluded pelvic cancer brings on two types of pain which must be differentiated if they are to be treated effectively. The pain caused by a lesion limited to the viscera is diffuse, bursting, or spasmodic in character, and can be relieved by resection of the pre-sacral nerve if not by a more direct surgical approach such as hysterectomy for pyometra following radiotherapy. The other type of pain is one which follows the distribution of one or more of the lumbo-sacral nerve roots into the lower limbs, and it is usually assumed that it is the result of the sacral plexus becoming involved in the neoplastic or inflammatory process. Todd points out, however, that there is rarely any evidence of this and the pathogenesis of root pains is obscure. When they occur it becomes necessary to block all the impulses travelling via the somatic nerves and spinal cord if relief is to be obtained. This has been done by chordotomy, but most would regard this as a formidable operation which is hardly justifiable in the circumstances. The injection of alcohol around the spinal cord in the lumbar region is preferable in that it is not only reasonably effective but is simple and free from serious risk. It is not devoid of all risk, however, for in addition to the usual hazards of spinal puncture it is sometimes followed by temporary loss of control of the sphincters and other sequelae implying damage to the spinal cord. Although these possibilities are not so serious as to outweigh the potential benefits to a patient whose outlook is hopeless, they make it necessary to emphasize that nearly all writers are agreed that intrathecal alcohol should be used only in cases of incurable malignant disease. It is therefore particularly important, though it may be difficult, to distinguish between a recurrence of growth and late tissue reactions to radiotherapy. Such reactions, sometimes resulting in fistula formation, are not infrequently seen in cases of carcinoma of the cervix and are thought to be the result of ischaemia. For these Todd advocates pre-sacral neurectomy, arguing that it not only relieves the intense pain which they cause, but that it may assist the healing process by producing vasodilatation.

The operation of pre-sacral neurectomy has no significant ill effects and can be used in the treatment of chronic pelvic pain caused by innocent as well as by malignant lesions. It is perhaps not quite so easy to perform as is implied by Greenhill, for the nerve fibres are usually widely dispersed and division of them all, which is essential for a good result, necessitates a fairly wide dissection of the area as far out as the ureters on each side. These, as well as the left common iliac vein and middle sacral vessels, are therefore exposed to risk. Moreover, it is not an uncommon experience to find visceral pain persisting after pre-sacral neurectomy, and it may be that in some cases more relief would be obtained if the autonomic nerves accompanying the ovarian vessels were also resected, as described by O'Donel Browne[7] for the treatment of ovarian dysmenorrhoea. Also it is possible, if not probable, that some sensory impulses are carried via the inferior hypogastric plexus and the visceral branches of the second, third, and fourth sacral nerves.

Epidural injections for the relief of pain in the pelvis and referred pain in the legs is also a comparatively old procedure, procaine (novocain) and saline having been used in the treatment of some forms of sciatica as well as pelvic

[5] *British Medical Journal*, 1945, **2**, 603.
[6] *Lancet*, 1937, **2**, 555.
[7] *J. Obstet. Gynaec. Brit. Emp.*, 1939, **46**, 962.

carcinoma. By such means Todd was able to give patients suffering from carcinoma of the cervix relief for as long as six to eight weeks. Meave Kenny now describes a modification in which 40–60 ml. of "proctocaine" are used, and claims that this agent relieves the pain for one to four months, at the end of which time the injection can be repeated. She considers that the method is so simple and free from risk that it can be carried out in the patient's home. Injections into the sacral canal, however, demand some detailed knowledge of the anatomy of the area, and are not always so easy to place as might be imagined, even for those well versed in the technique; various accidents due to the injection of analgesic solutions behind, or in front of, the sacrum or into a low-lying subarachnoid space have been described. Some medical men may therefore hesitate to tackle this procedure in domiciliary practice and may find it easier to carry out the ordinary spinal puncture which is all that is necessary for injections of alcohol. This, however, should not be allowed to interfere with further trials of extradural injections of proctocaine, for they may well prove to have special advantages.

Valuable as they are, none of these methods can be relied on to relieve pain in all cases, and the duration of relief, when obtained, is variable. Some patients experience both visceral and somatic pain and require two types of treatment. If blocking of the spinal roots or pathways is to be successful the agent must be applied at or above the level of the roots carrying the sensations from the affected part. So far as resection of autonomic nerves is concerned, further progress is to some extent hindered by the incompleteness of our knowledge of the sensory pathways from the various pelvic viscera.

PREGNANCY AFTER LUMBO-DORSAL SYMPATHECTOMY

Diseases such as phthisis and valvular disease of the heart in young women often become complicated by pregnancy and may then present difficult clinical problems. Another example is chronic hypertension, which was discussed by Browne[1] recently. In a leading article[2] commenting on his work reference was made to Adson and Allen's[3] report of a case of chronic hypertension treated by lower thoracic sympathectomy with good effect. A subsequent pregnancy, however, resulted in a rise in the blood pressure, which returned to normal only when abortion was induced. M. M. Peet[4] had a similar experience with a woman who suffered from malignant hypertension. That pregnancy does not always have such an adverse effect in this type of case is shown by J. L. Newell and R. H. Smithwick,[5] who gave an account of 14 patients successfully treated by lumbo-dorsal splanchnicectomy for benign or malignant hypertension. All these women conceived afterwards except one who was pregnant at the time of the operation. In 9 cases the blood pressure during pregnancy remained within normal limits; in the other 5 there was a significant rise during the last three months. One patient developed heavy albuminuria necessitating caesarean section at the thirty-fourth week. Only one baby was lost, but its mother had a living child the following year. All the women survived the pregnancy and were as well afterwards as before, so Newell and Smithwick conclude that given careful supervision it is permissible and safe for certain women to undertake childbearing after they have been successfully treated for hypertension. They note that women in the younger age groups tolerate pregnancy best. Study of the reports of published cases suggests that hypertensive subjects previously treated by sympathectomy react to pregnancy in a similar way to that of the untreated. None suffer permanent deterioration in their condition. Some go through pregnancy without any further rise in blood pressure, whereas others sustain sooner or later an increase in blood pressure and sometimes albuminuria as well. Also, in the description of one case there is a suggestion that there was a fall in blood pressure during the middle third of pregnancy.

One aspect of these cases of interest to the obstetrician and to the physiologist is the effect of such an extensive sympathectomy on uterine action. Unfortunately Newell and Smithwick make only brief mention of this. Caesarean section was carried out in three cases but in the remainder the comments suggest that pregnancy ended in normal delivery. One patient, however, is noted as having had a short and painless labour, and a second had no pain until the foetal head distended the perineum.

1 *British Medical Journal*, 1947, **2**, 283.
2 Ibid., 1947, **2**, 301.
3 *Ann. intern. Med.*, 1938, **11**, 2151.
4 *J. int. Chir.*, 1940, **5**, 1.
5 *New Engl. J. Med.*, 1947, **236**, 851.

INFANT MORTALITY AND SOCIAL CONDITIONS

The association of infant mortality with environmental and economic conditions is so well established that the former is generally accepted as an approximate index of the latter. Woolf[1] in a study of the infant mortality in the county boroughs during 1928–38 has used seven indices of social conditions: (1) percentage of families with more than one person per room; (2) average monthly percentage unemployment among insured adult males; (3) percentage of occupied males in Social Classes IV and V; (4) percentage of females aged 14 and over employed in manufacture; (5) degrees of latitude north of 50°30′; (6) gross reproduction rate; (7) weighted index of persons per acre. He examined the problem in great detail by means of multiple regression equations, obtaining equations in terms of the seven social indices for total infant mortality, age at death, stillbirths, and causes of death. An attempt was made to allot to each of the social indices the proportion of the infant mortality for which it was responsible. By inserting in the equation a zero value for the first four indices, putting the value of latitude at 50°30′ (the extreme south of England), the gross reproduction rate at 0.6, and by using a weighted index of overcrowding at 20 persons per acre, the author obtained a minimum mortality which he termed the rate among the "better-off" population. By putting the overcrowding index at 100% and the percentage of persons in Social Classes IV and V at 100, the gross reproduction rate at 1.6, density at 80, and taking the mean latitude, a value was found for the "crowded poor"; and by putting the unemployed at 100% in this equation a value for the "unemployed crowded poor" was obtained.

The scope and limitations of the regression equation are very briefly indicated, but, since there is a tendency to-day in many inquiries to follow a set statistical procedure without consideration of the practical applications of the results, it would have been better if the author had emphasized the limitations of the method he employed. This aspect is important, especially in a scientific inquiry of socio-medical problems, for they have an emotional appeal and the general reader may draw unwarranted conclusions. Given a set of social indices of a county borough the expected infant mortality can be determined from the regression equation, and the agreement between the

1 *Brit. J. Soc. Med.*, 1947, **1**, 73.

"observed" and "calculated" values may be quite good, although even with seven indices the prediction is far from perfect. Extrapolation is not permissible, nor can it be argued that a reduction in the size of the indices in any town would lower the infant mortality, since correlation is not necessarily causation. If therefore we were given the values of the indices of some urban area of the same general socio-economic type as those used to calculate the constants of the equation and, even more important, if the values of the indices were within the range of values used to obtain the constants, it is likely that we should predict the infant mortality quite well; but if the values were outside the range the prediction might be wildly inaccurate. To assign shares on the basis of an equation such as this to the different indices in a material sense may be quite wrong. The indices, purposely chosen because they correlate with infant mortality, may be only indirect measures of the true cause, which is probably much more complex than a simple equation suggests. There is, for instance, no evidence that latitude itself has any direct bearing on infant mortality; the rate for Sweden and Norway was considerably below that for England and Wales in the pre-war period. In England, for various reasons, industrialization and its attendant evils started in the North, with the result that there is a geographical distribution of highly industrialized towns. Latitude, therefore, may be regarded as an indirect index of social conditions and not as an independent cause affecting infant mortality. The ideal population postulated by Woolf obviously can never exist. The concentration of the county boroughs into the South of England is incompatible with a density of 20 persons per acre; neither is it practicable that women should be excluded from industry. The present tendency is possibly towards employing larger numbers of women than in the pre-war years. With a gross reproduction rate of 0.6 the great problem would be that of increasing the birth rate and not of decreasing the infant mortality.

Nobody doubts that economic factors influence the level of the infant mortality; it would, however, be going much too far to infer from analyses such as this that economic factors are of supreme importance. The elimination of adverse environmental conditions would decrease the mortality, but by what extent is merely a matter of conjecture. A variety of factors, not all economic, contribute to infant mortality, but it is of course possible from published data to inquire only into the broad aspects of the problem, and a field inquiry would be necessary to obtain more details. These factors and their possible influence on infant mortality must be considered to appreciate the complexity and extent of the problem. Hereditary factors must play some part, but they can be ignored when considering how infant mortality can be reduced, since it is hardly likely that unsuitable stock will ever be prevented from breeding. The care and nurture of babies is of primary importance, but only a very small proportion of indifferent parents in the population is needed to make a large difference to the infant mortality rate. Thus a waste of 2% of the births by criminal negligence, stupidity, or bad traditions in hygiene or feeding would increase the infant mortality by 20 per 1,000. Education has played an important part in reducing the wastage of infant life. The most obvious example of this is the reduction in the mortality from overlaying, which has fallen considerably during the past forty years. Some of the old notions of child management were also inimical to health—for example, the administration of a soothing mixture with a high laudanum content, which proved, on occasions, to be a too effective quietener. The importance of reasonable living conditions cannot be exaggerated, but the improvement of such conditions is a long-term policy, since it will take some years to solve the housing problem. The immediate hope of still further reducing infant mortality appears to lie in the greater diffusion of knowledge about the welfare and nutrition of babies. Many children are still unnecessarily exposed to risks of infection because of the parents' fatalistic views on the common infectious diseases of childhood.

A COMMITTEE ON CERTIFICATES

The Minister of Health and the Secretary of State for Scotland have appointed a committee of five to recommend "how far it would be practicable to reduce the number of certificates to be signed by medical practitioners." The full terms of reference are: "To consider the medical certificates required under present enactments or regulations, or for other administrative purposes, and to advise, without excluding the possibility of amending legislation, how far it would be practicable to reduce the number of certificates to be signed by medical practitioners and to improve and simplify the forms of certificate and the rules governing their issue." The committee members are as follows: Mr. Archibald Safford (chairman), Dr. J. Clifford Arthur, Miss Florence Hancock, Dr. Walter Jope, Mr. A. W. Neville, Mr. R. L. Briggs (Ministry of Health, Secretary). Mr. Archibald Safford is the Recorder of Faversham; Drs. Arthur and Jope, both general practitioners, are members of Council of the British Medical Association; Miss Florence Hancock is Chairman of the General Council of the Trades Union Congress and joint author of the Report on Post-war Organization of Private Domestic Employment, 1945; and Mr. A. W. Neville was formerly Principal Assistant Secretary in the Ministry of Health.

LASKER AWARD TO GREAT BRITAIN

The American Public Health Association at its meeting in October presented to Sir Wilson Jameson one of the Lasker Awards for 1947 "for food control in Great Britain and its effect on the health of the people." This came under the designation of "Group Awards," and took the form of a silver statuette. The award was made to the "British Ministries of Food and Health and to the four great leaders in the historic enterprise—Lord Woolton, Sir Jack Drummond, Sir Wilson Jameson, and Sir John Boyd Orr." The citation refers to the setting up in 1937 of an Advisory Committee on Nutrition by the Ministry of Health, and the subsequent establishment of the Ministry of Food. It records the fall during the war of the rates of infantile, neonatal, and maternal mortality, and states that, "although almost all other environmental factors that might influence the public health deteriorated under the stress of war, the public health of Great Britain was maintained and in many respects improved." The Lasker Awards Committee considers that the combined effort of the Ministry of Food and the Ministry of Health during the recent war "has been one of the greatest demonstrations of public health administration that the world has ever seen."

We believe this is the first time that the American Public Health Association has made a Lasker Award to a Government Department of another country, and no better choice could have been made. The burden falling on the chief medical officer of the Ministry of Health during those years of unprecedented stress was great, and the group to whom the Award was made could have had no more fitting recipient of it than Sir Wilson Jameson. (See also p. 881.)

THE NEWCASTLE-UPON-TYNE OBSTETRIC EMERGENCY SERVICE*

BY

FRANK STABLER, M.D., F.R.C.S., F.R.C.O.G.

Assistant to the Gynaecological Department, Royal Victoria Infirmary; Honorary Obstetrician, Princess Mary Maternity Hospital, Newcastle-upon-Tyne

The Newcastle-upon-Tyne Obstetric Emergency Service has flourished since early in 1935, when it was founded by Prof. E. Farquhar Murray, and it is entirely due to his organization and enthusiasm that it has grown to its present strength. From that time until the end of 1946, 353 calls had been made, 8,356 miles travelled, 30 gallons of intravenous infusion given, and 37 women had died. It is felt that an assessment of its work would be timely.

This centre is probably unique in England for the reason that there is not another university centre within 120 miles to the northward and 90 miles to the southward. The furthest distances travelled have been: to the north, Berwick (64 miles); to the south, Barnard Castle (41 miles); and to the west, Haltwhistle (37 miles). The population in this area is about 2½ millions, though three towns—Sunderland, Stockton, and Darlington—have not made use of the facilities. With these exceptions arrangements for fees have been made with the local authorities. In 1935 only one call was made, but the next year there were 11, and by 1939 the number had risen to 47. The numbers fell during the war years, but rose in 1946 to a record of 56.

From time to time suggestions have been made that subsidiary centres should be established, and it is probably true that beyond thirty miles much of the value of the service is lost. There are, however, two necessities without which the service would be valueless. The first is frequent use: unless there is frequent need to resterilize the apparatus, and a quick turnover of blood and plasma, the use of these becomes dangerous. The second is that there should be available a person who is familiar with the urgent conditions met with, skilful, quick to handle infusion apparatus, and ready for any obstetric operation. While speed is desirable it is not nearly so important as these two factors, and it is unfortunate that the nickname "Flying Squad" has been applied to the service. The apparatus alone has always been available for use by any practitioner who wished; in actual fact, it has never once been called for without a request for the attendance of a consultant. In the early days of the service the aim was largely to render a woman temporarily fit to stand the ambulance journey to hospital. Intravenous saline was the most frequently used infusion, and it was not for some years that stored blood was available. Twenty-seven women who had suffered from loss of blood or shock were brought in after restorative measures and nine of them died. This high figure shows the danger of such a journey, which is nowadays almost never necessary.

The Apparatus and Routine

The apparatus consists of six items and is accompanied by a nurse who has packed the bags and is familiar with the place of every detail in them. (1) A large box containing drugs, anaesthetics, antiseptics, mackintoshes, and ready sterilized bowls, douche-can, syringes, intravenous sets, and a canvas roll of instruments. (2) A small box containing sterile gowns, towels, gloves, and dressings for minor operative procedures. (3) A theatre drum with contents as No. 2, but in sufficient quantity to carry out an abdominal operation. (4) A crate of dried plasma, normal saline, and three or four pints of group O blood. It is hoped soon to provide a constant stock of group O Rh-negative blood and to carry it in a refrigerated container to avoid waste. (5) A bundle of blankets and hot-water bottles. These are scarcely ever needed, and now are often left behind. (6) A cylinder of oxygen and a B.L.B. mask. These have only rarely been needed.

A complete double set is available in case one set is already in use or is being prepared.

A practitioner faced with an obstetric emergency telephones the Princess Mary Maternity Hospital and makes his request. If he asks for a particular consultant, that consultant is communicated with first. Otherwise the consultants are telephoned in order of seniority until one is found available. It is thought to be essential for the efficient working of the service that a consultant should be quickly and immediately available, and it is no small pride to the Newcastle obstetricians that even in the war years a call has not gone unanswered. By the time the consultant reaches the hospital the nurse is ready with the apparatus. Using his own car, he transports all to the patient's house and carries out any treatment necessary—often some hours' work. When the nurse returns she at once prepares the gear for use again. As soon as possible after a case the practitioner notifies the medical officer of health. The hospital makes a charge of one guinea for its services, and the consultant sends in an account in accordance with an agreed scale, depending on the services rendered, the mileage, and the time of day or night, together with a short description of the conditions found. In some instances the local authority may recover all or part of the fees from the patient, or the service may be used for a purely private case.

Transport Difficulties

Mere distance is not such a difficulty as might be thought. There is a time lag of about twenty minutes getting the service into motion—taken in telephoning and reaching the hospital—so that even a case in the city is seldom reached in less than half an hour. At the other limit is Berwick, where a time lag of two hours may be reckoned from receipt of the call until the patient is under treatment. It is the experience of those operating the service that much of the mortality is due to deaths within a few minutes of the emergency arising. Women who survive half an hour it is usually possible to save within a reasonably longer time than this. On two occasions the squad failed to reach the patient. Once a car broke down, and a telephone call to the doctor showed that the emergency had passed. The second failure was due to a combination of an air raid, fog, and a very dark night with snow. Telephoned instructions were given to the doctor, and the next day the patient was brought into hospital, where she died. Great care must be used in taking exact instructions as to address, especially in the state of alarm that an obstetric emergency brings. Once a call came for Red Row. There are at least two villages in County Durham and two in Northumberland with this name. The fourth visited proved to be the right one. When nearing the objective small boys are easily the most efficient directors. At night take the local policeman aboard.

The Conditions Treated

Among the 353 cases treated there were 41 miscarriages, 20 ante-partum conditions, 45 intra-partum, 231 immediate post-partum, 15 late post-partum, and one not pregnant. They will be discussed under these headings.

*A paper read before the North of England Obstetrical and Gynaecological Society on June 6, 1947.

Miscarriages

There were 41 cases, with two deaths, in this group. It is very rare for a woman to die of blood loss from miscarriage, and both the deaths in this series were due to sepsis, one within half an hour of arrival of the squad and one a fortnight later. Most of these women appeared to be too ill to bear transport to hospital. I have vivid recollections of a woman blanched from an incomplete abortion in the loft of a pitman's cottage from which the only exit was through a hatch and down a ladder. Every time her feet were lowered to get her down the ladder she fainted, remaining unconscious for a long time. Transfusion and digital emptying of the uterus were carried out in the loft and she made an excellent recovery.

Ante-partum Conditions

The 20 cases (2 deaths) in the group were made up of 11 placenta praevia, 8 accidental haemorrhage, and 1 status eclampticus. Most of the haemorrhage cases received intravenous fluids and were then treated in various ways ranging from plugging of the vagina to caesarean section. Stored blood was not available until after 1940. Five of these cases were brought into hospital so that blood transfusion could be given, and it was in these five that the two deaths occurred. Since blood and plasma have been carried there has not been a single death in this group. Each of the two who died had intravenous glucose-saline, but the value of this was too temporary to protect her against an ambulance journey to hospital. They died shortly after admission, before blood transfusion could be established. There is no doubt that the pregnant woman who has lost blood must be saved an ambulance journey if at all possible, and this should be one of the prime objects of an obstetric emergency service. The patient with eclampsia had no further fits after the administration of morphine and intravenous magnesium sulphate. She was later safely delivered in hospital.

Intra-partum Conditions

Among the 45 cases (6 deaths) in this group were 13 of "failed forceps" with three deaths. Apart from one due to face presentation and one due to foetal malformation the causes of failure were the usual ones of occipito-posterior lie, incompletely dilated os, and the administration of pituitary extract in the first stages of labour. Other intra-partum emergencies were: obstruction due to monstrosity (7 cases, 1 death); prolonged labour (8); impacted transverse lie (2); breech (3); failure to deliver the aftercoming head (3); impacted shoulder (1); prolapse of cord (1); contracted pelvis (2); retained second twin (2); failed version with arm, leg, and cord prolapsed (1); diabetic coma (1 case, 1 death); and intra-partum rupture of caesarean scar (1 case, 1 death). In four of these cases the cord was prolapsed. These mischances will arise so long as district midwifery continues. The bad old system of transporting these gravely ill and shocked women to hospital lessened their chances of subsequent recovery. The salvage of infant life in this group is small, but it would certainly have been less still if domiciliary treatment could not have been carried out.

Immediate Post-partum Conditions

There were 231 cases, with 25 deaths. Fifteen patients were already dead when help arrived. It is in post-partum haemorrhage that the emergency service saves many lives and shows itself so dramatically necessary. Women blanched and moribund have been revived and restored to health. The lowest blood-pressure reading of a woman who recovered was 46/0, and systolic readings in the fifties are frequent. There were 186 cases of post-partum haemorrhage, divided into 88 with the placenta retained (8 deaths) and 98 after delivery of the placenta (10 deaths—3 associated with fibroids, 3 with heart disease, 6 with complete laceration of the perineum, and 1 with toxic goitre). There were, in addition to these cases of haemorrhage, 19 in which the placenta was retained without bleeding (2 deaths), 13 unexplained shock after delivery (1 death), 3 traumatic shock (1 death), 1 prolapse of cervix, 1 acute yellow atrophy of the liver (1 death), 4 incomplete rupture of the uterus (1 spontaneous), and 4 cases of acute inversion of the uterus (2 deaths).

With 18 deaths after post-partum haemorrhage in 186 cases it seems that some comment on the management of such emergencies would not be out of place, for in many of the cases it was possible to surmise that had proper steps been taken earlier the emergency would never have arisen. The rarity of its occurrence in any one man's practice should not induce him to forget the grave condition that may arise if he does not act promptly when he has the first warning. In a great many instances a doctor was called in for post-partum haemorrhage by a midwife. All too often the subsequent treatment consisted of repeated and ever more forcible attempts to express the placenta by grasping the uterine fundus (so producing shock) and pushing downwards (so adding to it). Clot is repeatedly expressed, but the placenta does not follow, and in desperation oxytocics are given with the placenta still *in situ*. The bleeding ceases only when the woman is so exsanguinated and shocked that little blood is reaching the placental site. Should the placenta come away in the course of this treatment the woman is found to be white and collapsed.

In the normal delivery of the placenta the contracted uterus is used as a plunger to expel the placenta from the vault of the vagina or the lower uterine segment, and downward and backward pressure is correct; but no amount of downward and backward pressure will expel the placenta *from the body of the uterus*—it will merely produce shock by dragging on the broad ligaments and damaging the uterus and ovaries. The correct treatment is gentle massage of the uterus until it contracts, and if it fails to contract the accoucheur should proceed direct to the next step. If it contracts the fingers should be passed over the fundus and the organ squeezed as in squeezing a sponge. No pushing of the uterus downwards should be permitted unless and until the placenta separates.

If this manœuvre is ineffective it should not be repeated; without any delay the placenta should be extracted manually, for repetition produces the rapid summation of haemorrhage and shock. Failure to go boldly on to this step before the woman has lost condition is due to the pernicious teaching that manual removal of the placenta is "the most dangerous operation in obstetrics." It is a life-saving operation. It is easier and less dangerous than the application of forceps. If the indications for expression of the placenta are there the indications for manual removal are there. So soon as the former fails the latter should be done. The frightening teaching about the operation has led not only to avoidance of it but to timid and half-hearted attempts to carry it out. A placenta inside the uterus can never be reached by two fingers or even the half hand in the vagina. In a gravely ill woman an anaesthetic may be dispensed with, but usually it will be necessary. The whole hand is introduced, and by making the other hand outside the uterus do the greater part of the work the placenta is separated by the well-known manœuvre. The placenta is grasped and withdrawn. The hand immediately goes back into the uterus to make sure that every fragment of placental tissue has been removed.

Again teaching has been at fault in laying down that the hand should not be returned to the uterus once the placental site is laid bare. It should return as often as is necessary to be quite sure that not a fragment of placenta remains. With even a small piece of placenta left behind sepsis is almost inevitable. With an empty uterus it is rare. A douche is not necessary. If the readiness to perform forceps extraction of the child and the reluctance to perform manual removal of the placenta were reversed there would be many fewer calls on the emergency service. Seventy-seven placentae were removed manually in this series for post-partum haemorrhage. There were two deaths. One woman died six weeks later of heart disease and sepsis, and one failed to recover for no other reason than blood loss after having had the placenta removed. It does not appear that manual removal of the placenta is a dangerous operation. It is delay in its application that is perilous.

The four cases of acute inversion of the uterus are interesting. Two of these patients died before the squad arrived, a quarter and half an hour after the call was made. In one of the other two the uterus was immediately replaced and the patient made a good recovery; in the second it was replaced digitally four weeks later.

An unexplained and little-recorded type of case is that in which a woman is apparently dying with the placenta *in utero* though without bleeding and in which she recovers rapidly when

Table showing Types of Catastrophe met with

No.	Year	Diagnosis	Treatment	Remarks
1	1936	Retained placenta and P.P.H. Large uterine fibroid	Manual removal of placenta	Died three months later at operation for fibroid
2	1936	Impacted double monster	Delivery; intravenous saline; manual removal of placenta	Moribund on arrival
3	1938	Failed forceps; face presentation	Manual extraction of foetus and placenta	Died later of shock, haemorrhage, and sepsis
4	1938	Septic incomplete abortion	Oxygen	Moribund; died in half an hour
5	1938	xi-gravida; ruptured upper segment caesarean scar	Morphine; transport to hospital	Died half an hour after admission
6	1939	Incomplete abortion	Digital removal; blunt curettage	Died of sepsis a fortnight later
7	1939	Accidental haemorrhage	Intravenous saline (2 pts.: 1·14 litres); morphine; pituitary; transport to hospital	In hospital blood transfusion (1 pt.: 568 ml.); forceps delivery; died 5 hours after admission
8	1939	Accidental haemorrhage	Intravenous saline (2 pts.); morphine; rupture of membranes; transfer to hospital	In hospital blood transfusion. Died undelivered after three hours
9	1939	Post-partum shock after B.B.A.; submucous fibroid size grape-fruit	Transfer to hospital	Died 5 minutes after admission
10	1939	Moderate secondary P.P.H. 13 days after delivery; B.P. 80/44; removal of placental tissue; shock	Blood transfusion 12 oz. (340 ml.); morphine; lobeline	Died after three hours
11	1940	P.P.H. after delivery with placenta praevia	Intravenous saline (1½ pts.: 850 ml.); pituitary; transport to hospital	Died of blood loss 1½ hours after admission
12	1941	Failed forceps (twice) and pituitary extract shock	Blood transfusion; internal version and extraction	Died of shock soon after delivery; uterine wall intact
13	1942	P.P.H. and retained portion of placenta	Manual removal; transfer to hospital	Died 29 days later of mitral stenosis and sepsis
14	1942	P.P.H. from retained portion of placenta 12 hours after delivery	Removal of placental tissue; plasma (1 pt.); glucose-saline (1 pt.); transfer to hospital	Died 2 days later of acute yellow atrophy of the liver (necropsy)
15	1942	Shock and retained placenta	Plasma (1 pt.); manual removal of placenta	Died 19 hours later
16	1942	P.P.H. after twin; (1) normal delivery, (2) internal version after failed forceps; B.P. 76/40	Plasma (1 pt.); morphine; pituitrin	Died ½ hour after arrival of squad
17	1943	P.P.H. after accidental haemorrhage	Blood (1 pt.); admitted to hospital 7 days later	Blood transfusion in hospital; died next day
18	1944	P.P.H. with retained placenta	Plasma (1 pt.); manual removal of placenta	Good immediate response, but died 3 hours later
19	1945	Post-partum shock and retained placenta after normal delivery of macerated foetus	Plasma (2 pts.); transfer to hospital	Blood transfusion in hospital but died after 5 hours
20	1946	Gangrene of vagina; general septic peritonitis 2 days after forceps delivery	Blood (4 pts.: 2·27 litres); penicillin	Died in another hospital
21	1946	Labour with diabetic coma	Transport to hospital	Died in coma day after admission
22	1946	Three calls: (1) failed forceps, os ½; (2) failed forceps; (3) shock due to rupture of vaginal vault into broad ligament	(1) morphine; (2) forceps delivery; (3) blood (2 pts.); transfer to hospital	Died as laparotomy about to be done

the placenta is removed. In a recent case the first glance at the woman made one think the squad had arrived too late, but she was found to have a pulse of 170, though this was impalpable at the wrist. Three pints (1.7 litres) of blood did not materially improve her condition. Five minutes after expression of the placenta she was chatting about housing and the weather and asking for food; she seemed to be almost a normal post-partum woman. Acute inversion of the uterus is analogous, for if the woman can survive the replacement of the organ the shock rapidly goes.

Late Post-partum Conditions

Fifteen calls came into this group, with 2 deaths. The cases comprised pulmonary embolism (2), macrocytic anaemia of pregnancy (1), puerperal sepsis (2 cases, 1 death), secondary post-partum haemorrhage from retained portions of placenta (9 cases, 1 death), and secondary post-partum haemorrhage from lacerations (1). It can be taken as axiomatic that in the absence of lacerations secondary post-partum haemorrhage means a retained piece of placenta.

Not Pregnant Case

There was one case of metropathia haemorrhagica, blanched, fainting, and with no palpable pulse at the wrist, for which the service was used.

The Deaths

Of the 37 deaths 15 preceded the arrival of the squad. These 15 were made up of 2 with acute inversion of the uterus, 11 of post-partum haemorrhage, and 2 of post-partum shock. Eight were after normal delivery, 1 after twin, 1 after concealed accidental haemorrhage, 1 associated with shock after a difficult forceps delivery, and 1 after a difficult forceps delivery of a brow presentation in a woman with toxic goitre. The remaining 22 deaths occurred among 338 patients in whom treatment was possible. They are listed above as examples of the types of catastrophe which have been tackled. The acknowledged inadequacy of the nature and amount of intravenous infusions is noticeable in the earlier years. The introduction of an efficient blood bank was a gradual process, so that for some years blood was only available sporadically and then in small quantities. Now that there is always an available supply of blood, restorative measures can be undertaken with much more assurance of success.

Conclusion

It is a pity to end this account with a list of deaths. Rather should one say that out of 353 calls 338 patients were attended and 316 were saved. What proportion of these would have died without the attentions of the Emergency Service it is impossible to say, but many of them were so gravely ill that there can be little doubt that the number would have been large. In addition it is unquestioned that much subsequent ill-health was forestalled. There is little danger of the service degenerating into a replacement for hospital emergency admission, for the "nuisance value" of these cases in general practice is sufficient to deter practitioners from unnecessarily calling for domiciliary aid. With increased freedom of transport and release from some war conditions, greater demands are being made on the service (in the first half of 1947 the number of calls averaged two a week), but it is hoped that these demands will be met.

HASTINGS MEMORIAL AT WORCESTER

A memorial to Sir Charles Hastings, founder of the British Medical Association, was unveiled on Nov. 19 in the Board Room of Worcester Royal Infirmary, the room in which the Association was founded 115 years ago. The ceremony was performed by Dr. H. Guy Dain, Chairman of Council, who was accompanied by Mrs. Dain.

The memorial, which was erected by the Infirmary Committee of Management in 1943, is of oak, and bears the words, carved and gilded, "To the memory of Sir Charles Hastings, Doctor of Medicine and citizen of Worcester, who on July 18, 1832, in this room, founded the Provincial Medical and Surgical Association, which later became the British Medical Association." Above it hangs an engraving of Sir Charles Hastings, and below the inscription is the text of Sir Charles's address at the first meeting of the Provincial Medical and Surgical Association, with a short account of his life and work.

Dr. Dain said that the Provincial Medical and Surgical Association was founded in that room by some forty or fifty doctors from as far away as Bath, Bristol, Birmingham, Cheltenham, Warwick, Hereford, and elsewhere. With

most of the medical men of Worcester and the neighbouring towns, they met there at the invitation of Dr. Hastings. He came to the infirmary as a house-surgeon at the age of 18 without qualifications, went to Edinburgh and graduated, and returned to Worcester as a physician on the staff of the infirmary at the age of 24. He was a man of enormous energy and originality. He started *The Midland Medical and Surgical Reporter and Topographical and Statistical Journal*. In the final issue of this journal he wrote: "A wish has been warmly expressed and widely circulated that the members of the profession residing in the provinces should unite themselves into an association, friendly and scientific." In the prospectus of the Association the first four objects set out were the collection of useful information through case reports; the increase of knowledge of the medical topography of England through statistical and other inquiries; the investigation of endemic and epidemic diseases; and the advancement of medico-legal science. The fifth object was: maintenance of the honour and respectability of the profession generally, in the provinces, by promoting friendly intercourse and free communication of its members, and by establishing the harmony and good will which ought ever to characterize a liberal profession.

At the first historic meeting in this room Dr. Edward Johnstone, of Birmingham, was elected the first President, and Dr. Hastings and Mr. Sheppard were appointed secretaries.

The Association Hastings founded extended its scope and changed its name to the British Medical Association. To-day the B.M.A. had branches and daughter associations throughout the Empire and all over the world, and a membership of over 57,000.

Charles Hastings was one of those rare individuals who saw clearly where there was need for a great step forward, and he had the energy, tact, and persistence to secure that that step forward was taken. To-day the ideals of Hastings and the early pioneers were unchanged. The first aim of the B.M.A. was still "to promote the medical and allied sciences, and to maintain the honour and interests of the medical profession." In its present negotiations with the Government on the matter of Health Services the Association was maintaining the principles Charles Hastings laid down.

THE HOUSE OF TO-MORROW

[FROM A CORRESPONDENT]

At the Building Exhibition at Olympia, which will remain open until December 4, the Ministry of Health has put forward some new ideas on the urban house of the future. The plans are in the blue-print stage, but if they survive the criticism of architects, builders, and others interested in the housing of the people they will be passed on to local authorities.

In this country the small house is traditionally of two stories. There are, of course, innumerable houses in towns with three or four or more stories, and in the country plenty of cottages and bungalows with only one, but the general pattern of working-class housing has been "an upstairs and a downstairs." The Ministry shows a model of a terrace of three-story houses with two rooms at each story intended for the accommodation of a family of five or—with rather more space though not more rooms—of seven. A terrace of ten three-story houses with no break between them is not aesthetically pleasing. A frontage with eight doors, with another door round the corner at each end of the terrace, is not perhaps the happiest arrangement, and the narrowness of the houses is emphasized by their height. On the other hand, this form of construction contrives to give rooms as large as possible, and there is a terrace roof which perhaps compensates for the additional stairs. This type of house is in a sense a reply to the garden city or suburb, which demands space and therefore cannot be planned near to the centre of large cities. These houses occupy the minimum of ground space and therefore may be built within easy distance of the business area.

Another design put forward by the Ministry consists of four-story combined maisonettes and flats, with access balconies. The maisonettes are intended to meet the needs of people who want to combine the convenience of a flat with the freedom of a house. They are of four or three rooms, and the flats in the same block are two-roomed. This is another departure from the stereotyped council house.

The encouraging thing about these developments is the attention which architects are paying to the small individual house and particularly to the arrangement of the working-class kitchen and living-room. Rural families, it is said, prefer the kitchen and living-room to be combined, while industrial families like to have their meals in the kitchen. The families of city workers mostly prefer to keep the kitchen for cooking and laundry only. Full-scale rooms show how each of these preferences may be met with a minimum of labour and with the greatest saving of space.

The Government exhibit, with which the Department of Scientific and Industrial Research is associated, is only a small part of what the building industry is presenting in the vast spaces of Olympia. With new methods of plastering, partition walls, insulated flooring, warming and cooking systems, and new arrangements in glass and timber and steel and aluminium, the shape of the house to come seems very desirable.

THE LASKER GROUP AWARD, 1947

AMERICAN HONOUR FOR BRITAIN

The illustration below shows Dr. George Baehr (centre), chairman of the Lasker Awards Committee of the American Public Health Association and president of the New York Academy of Medicine, presenting one of the Lasker Group Awards to Sir Wilson Jameson, Chief Medical Officer of the British

Press Association

Ministry of Health, with Dr. Lowell J. Reed, of Johns Hopkins University, looking on. Sir Wilson accepted the award on behalf of the British Ministries of Food and Health for the wartime programme of food distribution in Britain.

Dr. Reed accepted a similar award for the U.S. Committee on Joint Causes of Death, of which he is chairman, for uniform

classification of statistical data on death and disease, facilitating the interchange of medical information between all countries of the world. Dr. Reed is vice-president of the Baltimore University.

The presentations were made at the 75th annual meeting of the American Public Health Association on Oct. 9, at Atlantic City.

Reports of Societies

BRACHIAL NEURALGIA

At a meeting of the Physical Medicine Section of the Royal Society of Medicine on Nov. 12, Dr. W. S. TEGNER, president of the Section, was in the chair.

Dr. W. RUSSELL BRAIN opened a discussion on brachial neuralgia, which he defined for this purpose as pain of nervous origin in the upper limb. Until recently the commonest cause was held to be brachial neuritis. So far as he knew no pathologist had ever observed a simple neuritis of the brachial plexus. The causes of brachial neuralgia were many and varied. Cervical rib held the field for a long time, until it was shown that symptoms might be present without the rib and absent with the rib. The way of wisdom was to make a frank confession of ignorance and to maintain a healthy scepticism towards the many theories put forward.

Dr. Brain said that with seventh cervical root or spinal nerve irritation there might be pain and tenderness in the neck and shoulder, in the scapular and pectoral region, and also along the dorsal aspects of the arm, forearm, and middle finger. It might be expected that all contiguous areas of the dermatome would suffer equally, but most lesions were partial ones which did not affect all forms of sensibility equally nor all areas to the same extent. Motor symptoms were less prominent than sensory, and muscular weakness was usually only slight. Congenital abnormalities were quite common in cervical or spinal nerve manifestations and played a part indirectly in the production of other symptoms. He described the clinical picture of herniated cervical intervertebral disk. The patient usually complained of considerable pain in the neck, which might develop quite suddenly, and he might be compelled to lie on his back because lying on either side increased the pain in the shoulder and arm. Occasionally a herniated cervical intervertebral disk would compress the spinal cord. Among major abnormalities found in this area Dr. Brain mentioned a fibrous band from the seventh cervical transverse process, abnormal shape or unusual height of the first rib, and abnormal origin and insertion of scalenus anticus. More than one of these anomalies might be present. It had been suggested that scalenus anticus spasm or hypertrophy alone might be responsible for symptoms. Dr. Brain also mentioned the costoclavicular syndrome, and illustrated one case with three cervical ribs. A spontaneous form of compression neuritis of the median nerve had only recently been described and recognized, though for some time it had been known that local injury of bone in the region of the wrist-joint might cause compression of the nerve.

Dr. Brain mentioned a condition occurring frequently among middle-aged or elderly women who had done a good deal of housework. They complained of tingling and pain in the region of the median nerve, associated with weakness and wasting of the muscles of the thenar eminence. The correct treatment if the condition was early and there was no muscular wasting was by rest and physiotherapy, provided they were able to give up manual work afterwards; if they were not able to do so they would almost certainly relapse. In cases which had gone on to muscular wasting and sensory loss surgical treatment was indicated, and those operated on had done exceedingly well. One curious manifestation during convalescence in some of these cases was the development to a mild extent of a Raynaud-like syndrome in the fingers, particularly during the first winter after the operation.

Surgical Experience

Mr. D. W. C. NORTHFIELD reviewed a number of cases with pain in the arm as the presenting symptom. The first group consisted of cases in which the trouble was due to pressure or traction on part of the brachial plexus. There were 27 cases in this group, in 6 of which the symptoms were bilateral. Females predominated, and the commonest age period was between 30 and 50. In at least half the cases *x*-ray examination showed the presence of at least a rudimentary cervical rib. On the whole the pain followed the distribution of the first thoracic nerve. At night some patients were more comfortable lying on the affected limb, and others lying on the back. In 18 cases there were complaints of circulatory changes, and in 19 the patients had noticed some disturbance of muscles or actual muscular wasting. Wasting and weakness of the intrinsic muscles of the hand and of the lateral part of the thenar eminence were frequent. Some impairment of sensation was noticed in 13 of the cases. The operation was primarily one of exploration. Even when *x* rays showed a cervical rib he did not start out with the idea of removing it, but decided the correct procedure in the light of the findings at operation.

His own feeling was that in cases which demanded operation the division of the scalenus anticus probably offered a good prospect of a satisfactory result. He thought also that nerve-pressure effects were due not so much to the nerve being pressed on or riding across the first rib as to compression of the subclavian artery, the pressure in the artery being transmitted to the nerve. It was this transmitted pressure rather than the rib itself which caused symptoms to appear.

A number of cases of thickening of the ulnar nerve at the elbow were mentioned. In 26 cases, predominantly male, the condition was bilateral in 3. There had been antecedent injury to the elbow, ranging from minor bruising to severe fracture, in 11. In this condition there might be an occupational factor; 2 of the patients were violinists, and 8 were labourers on heavy work. In 19 of the 26 cases pain was present, felt sharply around the elbow and radiating downwards to the little finger. In some of the cases wasting of the small muscles of the hand had been observed by the patient. Transplantation was the operation of choice. The nerve itself was found in some cases thickened to twice the normal size.

Ten cases of cervical intravertebral disk were described, in all but one of which protrusion was found. It was possible that the protrusion eventually became absorbed, but during the process it might cause scarring and thickening of the membrane. In the 9 proved cases the protrusion occurred between the fifth and sixth cervical vertebrae in 4, between the sixth and seventh in 2, and in the remaining 3 between the second and third, the third and fourth, and the fourth and fifth cervical vertebrae.

DIET AND THE NATION'S HEALTH

DEBATE BY THE HUNTERIAN SOCIETY

A debate was staged by the Hunterian Society at the Apothecaries Hall, London, on Nov. 17. Mr. ALEX. E. ROCHE presided over an attendance of between three and four hundred. The supporters of the motion "That our present diet is undermining the health of the nation" were two medical men and the opposers two doctors of science.

The Missing Calories

Dr. FRANKLIN BICKNELL took the affirmative. Man required 3,000 calories a day. That was the figure agreed by the British Medical Association in 1932 and by the Ministry of Health in 1933, while the League of Nations Committee admitted a higher figure. From his rations, according to a statement by Dr. Summerskill (on Oct. 29), an adult British citizen obtained 1,530 calories. Since then potatoes had come on the ration, and, with an adjustment for bad potatoes, added 139 to the daily figure. How was the gap between 1,669 and 3,000 to be bridged? Unrationed foods such as offal and meat pies were not with certainty obtainable, and fish and vegetables were the principal unrationed foods left. A Ministry of Food survey last July mentioned 2,237 calories as the average consumption *per capita* in a working-class family; this was before potato rationing and the cuts in cheese and sugar. Restaurant and canteen meals were cited as meeting the deficiency, but "meals out" *per capita* accounted for only 1½ main meals and 2½ snack meals a week, and a main meal might be only about 350 calories. If anyone was surprised to be told that his calorie consumption now was only half what it was before the war he

should bear in mind that a meal of boiled fish, boiled potatoes, and bread and cheese would furnish about 300 calories, whereas the same fish and potatoes fried, and with butter on the bread, would add up to 1,000 calories. That was the explanation—absence of fat. The housewife, who had small chance of eating out, was told that she could have the redundant rations of her children; but those who knew the consuming capacity of a growing boy would be aware that there was not much to spare from that source.

How was it, then, that we were not always hungry and not very thin, and why did not the mortality and morbidity rates go up? Sir John Boyd Orr had said that the loss of genuine hunger was one of the earliest signs of malnutrition. Moreover, with an inadequate diet a person did not of necessity lose weight. The body conserved its resources by the simple process of lessening productivity. In explanation of the mortality figures he pointed to the advances in chemotherapy and in surgery during the last eight years, the advances also in maternal and child welfare and in diphtheria prophylaxis. It might have been expected that there would have been a much greater fall in mortality rates had not these advances been largely nullified by the inadequate diet. As for morbidity, the notifications of tuberculosis had gone up, eye diseases and skin diseases were more common, convalescence was longer. He even attributed some of the decay in morals to the lassitude induced by inadequate feeding. Fatigue was one of the first evidences of deficiency.

Opposing Views

Sir JACK DRUMMOND declared that there was no objective evidence showing with clarity and precision that the nation was less well nourished than it had been in 1938. He agreed that the calorie situation was important. His old master, Sir William Bayliss, used to say, "Take care of the calories and the rest will take care of themselves." There was much misunderstanding on this point to-day. It was very easy to misinterpret the figure of 2,700 calories which the Government had recently announced. The population included young children and adults, sedentary workers, light manual workers, heavy workers, and the requirements spread themselves over a very wide range from those of the infant to those, say, of the forester engaged in heavy labour in cold weather, whose calories might perhaps reach 5,000 a day.

Before the war there was maldistribution of food, resulting in the undernourishment of about one-third of the population, and as the food supplies were adequate for the whole population it meant that the other two-thirds were in a sense overfed. No one denied that present restrictions were grievous, but at least the war had equalized distribution and imposed equality of sacrifice. Since 1941 a close check had been kept on the nutritional value of food. No one liked the wartime diet, but it was all that could be obtained, and an analysis of it showed that nutritionally it was better than the pre-war diet.

As to the results, there was no more sensitive indication of health than vital statistics. The general death rate, the infant and maternal mortality rates, the death rate from tuberculosis had all improved since 1940. The incidence of anaemia in women and of rickets in children had declined; the rate of growth of children had increased. He spoke as one who had seen starvation in several Western European countries after D-day, and "We are not up against anything like that, thank God!" Bread and potato rationing had made the position grave, but he was not as apprehensive as Dr. Bicknell. Provided there was no major dietary deficiency, a simple calorie shortage was not a very serious matter. Inevitably it would reduce production. The present calorie level would only barely meet the estimated requirements, and this must mean that the heavy worker and the adolescent, whose energy requirements were high, would go hungry and their productive capacity would fall. That had happened in France and everywhere else, but it was not an undermining of health. These people might for a few months produce less than expected, but they would even up as things got better. While the present food situation was serious—far more serious than they ever thought it would be six months ago—there was no reason for believing that the diet, plain, unattractive, and monotonous as it was, would undermine health. In no country was the food so well distributed. In France, or even in Eire, the rich could feed as well as they wanted, and the poor could go to the wall. In this country "we are having a devil of a time, but at least we are all more or less suffering together. I challenge those who support this motion to bring forward any clear objective evidence—not hearsay, not merely subjective impressions—that the health of the nation has been impaired."

Views of a General Practitioner

Dr. KENNETH MCFADYEAN, as a general practitioner, spoke in favour of the proposition. Someone had written in an editorial that the impressions of medical practitioners were founded on general complaints by patients of fatigue, lassitude, and an "out-of-sorts" feeling, but, the editorial went on, "no one has brought forward evidence to show that they are attributable directly or indirectly to lack of food." But what evidence was wanted? At least one general practitioner had drawn attention to the increasing number of cases of hypochromic anaemia, a condition in which frequently the only symptom was fatigue and there were no signs until the victim collapsed on the factory floor, but it had also been shown that the addition of protein to the ordinary rations banished hypochromic anaemia. It was all very well to quote figures concerning children, but what about the people between 20 and 50, the workers who had to maintain themselves and the children and the aged people? It was in the third to the fifth decade that hypochromic anaemia and other dietary deficiencies asserted themselves. How many women succeeded in nursing their babies for longer than four weeks? What about the increase in infantile gastro-enteritis? In a recent series of cases at Great Ormond Street, of 167 infants with gastro-enteritis admitted only one had been fed naturally. It took the mother all her time to feed herself, let alone her infant. He also referred to the increased prevalence of skin diseases in the adult population—impetigo and sycosis barbae. The latter condition formerly was not seen once in five years by a practitioner, now he saw any number of such cases. They were due to the absence of fatty acids to protect the skin. Ophthalmologists spoke of an increasing number of inflammatory conditions in the eye and of patches of choroid degeneration in young adults. Chronic rheumatic infections were increasing. The objective evidence "stuck out a mile." An army was expected to march on its stomach, but those who ordered our rations to-day apparently expected us to fly on air, blowing out gases from our empty exhausts, belching forth exports from empty stomachs. The general practitioner might not be a statistician, but there was knowledge and common sense behind his observation.

The Verdict from Statistics

Mr. MAGNUS PYKE said that nutritional health depended on the provision of a properly balanced diet, with proteins, fats, carbohydrates, and the rest, which had been demonstrated by experiment to be needed for the proper function of the body. There were many different patterns of diet. In no country did the official rations provide the sole food for the subsistence of the population. In addition to the strict rations there were unrationed meals distributed through restaurants and canteens, special rations for invalids, school meals, food from allotments, and certain unrationed articles of food such as fish, rabbits, and vegetables. If the health of the nation were being undermined it would show itself in the mortality tables, but the fall in that respect, which had been a feature of public health during the present generation, had continued during the war and into the post-war period. He had figures also showing the steady increase in the height and weight of children. The average weight of a number of 12-year-old children in Liverpool in 1935 was 33.4 kg., and in 1946 for a similar group it was just upon 35 kg. It was notoriously difficult to assess the nutritional state of the adult and to measure precisely whether his health was or was not undermined by diet. The biological system of man was infinitely adaptable to circumstances. But tuberculosis was closely related to nutrition, and if shortage of food were undermining the health the incidence of tuberculosis would have shown a marked increase, which was not the case. Tuberculosis mortality had fallen steadily since 1942. Old people, who had perhaps the greatest difficulty in obtaining a full diet, had shown a decreasing death rate in every quinquennium since 1926–30, but the greatest decrease was

shown in the quinquennium 1941–5. Conditions like obesity, alcoholism, high blood pressure had had less chance to operate.

Even when the full rigours of reduction of supplies came into force in 1948 the consumption level of 2,700 calories would still be sufficient to cover the population. That figure was made up as to 72% of calories distributed as rations, the remainder was derived from the diverse avenues of distribution he had already named. The average for each school meal was 849 calories.

General Discussion

The PRESIDENT, in throwing open the meeting to discussion, said that it was not merely a question of the value of the diet, but of obtaining it. Many of the calories in the ration must be spent in queueing to get it. Dr. NEVIL LAYTON said that people were apt to compare European countries with Britain, to the latter's advantage, but actually, although the ration in Norway, Holland, and Czechoslovakia might not be generous, the fats were approximately double the amount obtainable in Great Britain. He had come across cases of nutritional oedema in this country. Dr. G. E. BREEN asked for the basis of the assertion that, before the war, one-third of the population was underfed. Assuming that the unemployed were underfed, they and their dependants would not have amounted to more than four-and-a-half millions, or 10% of the population. Surely the lowered rates of mortality or morbidity could justly be ascribed to the sulphonamides and penicillin, to diphtheria immunization, and to other advances which had made their appearance during the last ten years—one of the most revolutionary periods in the history of medicine. He complained of a certain presumption and arrogance on the part of professional nutritionists. He wondered how their bold statements would look in thirty years' time.

Mr. DICKSON WRIGHT came down heavily against the proposition that the present diet was undermining health. In the present company he could detect no signs of malnutrition; they gave the appearance of a very well fed assembly. Some of the arguments used in support of the proposition had been trivial. The occurrence of diseases like impetigo had been cited as evidence of malnutrition. Yet it was only a short time ago that a gentleman from the United States, that land of plenty, arrived at London Airport and was found to be suffering from impetigo, and was not allowed to remain but was sent back by the next aeroplane to his own country. If we were faced with real food deficiency, what about the millions we spent on alcoholic liquor and on tobacco? What food those millions would purchase! It had even been suggested by the principal speaker in favour of the proposition that our present diet was the cause of the decline in morals. It made him imagine a co-respondent in the divorce court begging the judge not to be too hard upon him because he had been underfed!

The openers made brief replies. Dr. BICKNELL begged for a serious decision on the part of the meeting—a decision, he said, the effect of which would go beyond that assembly. Sir JACK DRUMMOND claimed that no concrete facts had been brought forward to support the view that there had been deterioration of health as a result of diet. All the objective evidence went to show that the health of the nation was not undermined. Indefinite statements about skin conditions, gastro-enteritis, chronic rheumatism, and the like, being attributable to diet should not be taken too seriously. He recalled that in 1940 the Parliamentary Secretary to the Ministry of Food announced that on the suggestion of the medical advisers to the Ministry it had been determined to add a proportion of calcium to flour. Within a week the Ministry received protests, which continued for months afterwards, declaring that the calcium in the loaf was responsible for all manner of ills. Medical men claimed that their patients were suffering as a result. Some of these medical men bore well-known names. Yet in actual fact, owing to a hold-up of supply, no calcium was added to flour for eighteen months after the announcement, and after it was added there were no complaints.

The question "That our present diet is undermining the health of the nation" was put to a show of hands, and the vote of the meeting was in the affirmative by about three to one.

Mr. MORTIMER WOOLF, in proposing a vote of thanks, said that after this array of statistics and arguments he still thought the best dietetic advice was given from the music-hall stage, "A little of what you fancy does you good."

Correspondence

Penicillin Blood Levels

SIR,—We have just finished investigations concerning the excretion and the role of penicillin in the organism, and we present here a preliminary report. Our first results, which will be published in detail elsewhere (*Acta Medica Hungarica*, Budapest) can be summed up as follows.

The investigations were carried out in order to raise the serum-penicillin level and to diminish its excretion. We found that the hippuric-acid content of the blood and the urine can be easily and continuously increased by means of vegetable protein meals, especially by oatmeal. The troublesome para-aminohippuric-acid drop infusion, suggested by Beyer and his collaborators, can be avoided thus. The serum-penicillin level can be considerably raised by an oatmeal diet, and its excretion can be reduced to such a degree that, six hours after a single injection of 60,000 units, a powerful bacteriostatic effect is still demonstrable in the serum. The quantity of the penicillin and the number of the injections can be reduced thus. A similar effect could be demonstrated by the administration of a single dose of amidopyrine, 0.3 g. per os. If this dose was repeated two-hourly, the bacteriostatic power of the serum could be maintained as long as six hours (20,000 i.u. of penicillin being administered before).

Clinical symptoms led us to assume deficiencies in some vitamins during prolonged penicillin treatment. This is particularly striking in the case of vitamin C. Considering the well-known role of vitamin C in infections, this relation can be of importance in future penicillin treatment and in the explanation of the bacteriostatic effect of the penicillin.

In connexion with sensitization phenomena as the result of penicillin treatment, it was possible to produce with the serum of one of our patients a positive Prausnitz–Küstner reaction (passive transfer of antibodies) after the administration of 21,000,000 units of penicillin. It was also possible to demonstrate changes in the appearance of different cutaneous tests—e.g., von Pirquet—during the penicillin treatment—i.e., the positive von Pirquet test became weaker afer a few weeks' treatment or changed into a negative one.

Bacteriological studies revealed that in contrast to data already published in the *Journal* (Ellinger and Shattock, 1946), the bacterial flora of the alimentary tract remains substantially unchanged during the penicillin treatment. Haemolytic streptococci disappear from the flora of the mouth and throat, but other streptococci and staphylococci, as well as penicillin-insensitive bacilli, continue to be present in unaltered quantities. The intestinal flora remains likewise unchanged.

In view of the fact that great quantities of penicillin—a weak acid—are excreted in the saliva and in the bile, the eventual changes of the *p*H of the saliva and the digestive potency of the intestinal enzymes were investigated after penicillin treatment. The *p*H of the saliva diminished in every case during the treatment. The diastase values (Wohlgemuth) of the faeces have decreased similarly. These contributions may be of importance in the nutrition of patients during penicillin treatment.

Investigations into the diffusion properties of penicillin reveal the fact that 0.5 i.u. of penicillin does not pierce a layer of fibrin 3 mm. in depth prepared from pure thrombin solution and crystallized fibrinogen solution *in vitro*, but it will be adsorbed by it, since 0.5 ml. of precipitated fibrinogen adsorbs less than 1 but more than 0.5 i.u. of penicillin. This adsorption can be inhibited and adsorbed penicillin can be eluted again by adding a solution of sodium dehydrocholicum.

Difficulties encountered in treating the heart-failure symptoms of penicillin-treated cases of endocarditis led us to investigate the possible interference of penicillin and digitalis. Electrocardiographic changes in penicillin-treated pigeons and their altered response to pure digitoxin show that prolonged penicillin treatment has an influence perhaps directly on the sinus node. There is no real interference between the two drugs, but subclinical sensitization with penicillin and lessening of the B_1-vitamin content of the organism may cause an increase of lipoids, especially of cholesterol. The latter is apt to absorb one part of the digitalis glycoside.

The reduced glutathione level in the blood rises after a single injection of 20,000 i.u. of penicillin and becomes constantly higher during prolonged treatment. This fact may be of importance to the mode of action of penicillin, glutathione being composed of glutamic acid, cysteine, and glycocoll (glycine). It is possible, therefore, that this increased amount of glutathione has a similar effect upon the glutamic acid of bacteria, as sulphonamides have against para-aminobenzoic acid.

Detailed communications in connexion with this work appeared or will be published in the *Orvosok Lapja* and *Magyar Belorvosi Archivum*, both in Budapest, *Acta Medica Scandinavica*, Stockholm, and *Schweizerische Medizinische Wochenschrift*, Basle.—We are, etc.,

L. MOSONYI. G. DUCKS.
R. HELD. C. KOCSÁN.
E. OBLATT. M. SURJÁN.
G. SZÉCSEY. A. SZENDEI.

Budapest.

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Penicillin for Infected Hands

SIR,—In his letter on the use of penicillin in the treatment of infected fingers (Nov. 1, p. 707) Dr. E. Jaffe suggests that prophylactic penicillin may be used with some success in very early cases to abort the condition. I wonder if this is not rather a precarious statement to make in view of the possible severe consequences. I have recently seen two cases of palmar-space infection which appear to illustrate the risks which may be involved by conservative treatment. It is because of the extreme difficulty of diagnosing the presence or otherwise of pus in these cases that I wondered if Dr. Jaffe or anyone else had experienced any similar recurrences in very early cases of pulp infection.

The first, a young man, reported sick with a diffuse swelling of the palm of his left hand of twelve hours' duration. The swelling was compatible with an early inflammation of the middle palmar space, but was only tender to moderate pressure. He had slept well during the night and had experienced no pain. He had no fever, lymphangitis, or lymphadenitis. He was sent to hospital immediately, where he received a course of 750,000 units of penicillin given in equal three-hourly doses over a period of ninety hours. There was no surgical interference. He was discharged two days later symptom-free and with full function of the hand.

After seventeen days he had six carious teeth extracted. Twenty-four hours later he presented with a similar swelling on his hand, which was throbbing and acutely painful. He was running a slight temperature. He was returned to hospital, where a good result was obtained with surgical drainage of the palmar space followed by a further course of penicillin.

The second case, also a young man, presented with a painless swelling of the palm of his right hand of approximately sixteen hours' duration. The swelling suggested an inflammation of the middle palmar space, but it was tender on deep palpation only. There was no constitutional disturbance. He was sent to hospital, where he received exactly the same conservative treatment as the previous case. On discharge he was symptom-free and had full function of the hand. Fourteen days later he caught his hand in a trapdoor, resulting in mild bruising. The skin was not broken, but the same evening his hand became intensely painful and swollen on the palmar side. When I saw him at midnight (fourteen hours after injury) he presented the clinical picture of very acute middle palmar-space infection. He was returned to hospital, where the condition was successfully treated with surgical drainage followed by a prolonged course of penicillin. The final result was excellent. (There had been no bony injury.)

It would appear probable that despite the short duration of the original symptoms a small pocket of pus had formed in both cases, that the first course of penicillin had been sufficient to sterilize this pus and render it quiescent for a relatively long period, and that reinfection of the focus was brought about in the first case by a transient bacteriaemia and in the second by moderate trauma. These cases demonstrate the results which may follow neglect of the simple rule that chemotherapy should never be used in cases of suppuration in the absence of adequate surgical drainage. But, with this in mind, they further show the extreme difficulty of diagnosing the presence or absence of pus in very early cases. The severity of the second infection and the increased loss of man-hours involved, despite clinically adequate treatment with penicillin, demonstrate the dire results which may follow misjudgment in the case of palmar-space infections. I wondered at the time whether more intensive penicillin therapy in the first instance, despite the clinical cure, would have prevented the recrudescences of infection.

It would be interesting to know if others have had similar experience with fascial-space infections, and whether the earlier appearance of pain in pulp infections does in fact increase the chances of successfully instituting penicillin therapy before the actual formation of pus.—I am, etc.,

Leamington Spa. A. GORDON DINGLEY.

British Food Resources and Requirements

SIR,—According to the report of the conference arranged by the Nutrition Society (Nov. 15, p. 786) I said that the agreement of estimates of food supplied and consumed "was as good as could be expected in view of the low degree of accuracy of dietary surveys." What I actually said was that the agreement was better than could be expected in view of the inaccuracy of estimates of the amount of food imported and produced in the country. The point is important, for if we were getting an average 2,800 calories per head, as reckoned from estimates of imports and production, there would be no need to worry about calories.—I am, etc.,

London, E.1. J. R. MARRACK.

Food Cuts and Vitamins

SIR,—Your interesting and valuable leading article entitled "Food Cuts and Vitamins" (Nov. 1, p. 696) calls for comment on three separate matters.

First, I conceive it a pity to refer to "the new standards of the National Research Council of the U.S.A." That body, in both editions of its reports and through the mouths of several of its members on a number of occasions, has consistently asserted that it was not laying down dietary standards. It has called its estimates, and given convincing reasons for so doing, "Recommended Dietary Allowances." These allowances, unlike any estimates of requirements, are intended to allow for at least part of the losses that occur during processing, transport, storage, and cooking, and are also meant to "take up the slack" for those individuals at one end of the scale of requirements for any given nutrient. Nothing is more striking in such recent publications as the invaluable monograph of Widdowson on school-children's diets than the extraordinarily wide range of intakes, and these strongly suggest a correspondingly wide range of requirements. The American recommendations are intended to take care of the higher of these requirements and so would obviously supply more than is necessary to those with lower requirements. They cannot, therefore, be themselves regarded as figures for requirements, and are, as their promulgators make clear, simply recommended allowances.

Secondly, I am a little surprised that your comments on riboflavin intake ignore one of the most striking and in some ways entertaining facts revealed by wartime studies of diet. In this country, at any rate, beer and tea can provide an appreciable part of the daily intake of riboflavin and also of nicotinic acid; for the more intemperate they may even provide major contributions.

Finally, there seems to me a serious error in your parenthetical observation that "as is now the accepted practice in this country, the vitamin-A value of β-carotene is taken as 1 i.u. per 0.6 μg." Dr. Leslie Harris's article (p. 681), to which you make specific reference in your leader, says quite clearly "carotene is only about one-half or one-third as well utilized by the animal body compared with an equal amount of vitamin A." Without going into elaborate arithmetical details it must suffice here to say that although 0.6 μg. of pure β-carotene has, by definition, the activity of 1 i.u. of vitamin A, this refers to comparative tests under carefully standardized conditions of vitamin-A-depleted albino or piebald rats. It is universally accepted that the efficiency of converting carotene to vitamin A is much less for man and other domestic animals receiving mixed diets and not obviously short of vitamin A. There is some evidence that the efficiency of conversion diminishes with increasing levels of vitamin A in the diet. If that is so, any figure for equivalence of the vitamin and the provitamin can be only a rough approximation. Experts in this country and the United States seem, on this matter at any rate, to be largely in agreement that the only safe assumption for the

nutritionist to make is that 2 μg. of carotene is required to supply in an ordinary diet the equivalent of 1 i.u. of vitamin A. This, incidentally, is a highly practical question and not an academic matter of figure manipulation. If a daily intake of 2,500 i.u. is required and 500 of these are supplied as preformed vitamin A, the amount of carotene needed in addition will be either 1,200 μg. or 4,000 μg. per day, according as we take 0.6 μg. or 2 μg. to be equivalent to 1 i.u. This, according to "Nutritive Values of War-Time Foods," represents the difference between 12 and 40 g. of fresh summer carrots or between 3 and 10 oz. (85 and 284 ml.) of liquid summer milk.

Incidentally, the Medical Research Council War Memorandum No. 14, to which I refer above, contained on p. 4 of the original edition an unfortunate printer's error, whereby it is stated that 1 i.u. has, by definition, the potency of 0.06 μg. of β-carotene; this was subsequently corrected by an erratum slip to the correct figure of 0.6. I would, however, again emphasize that this equivalence is a matter of definition applying to certain specified laboratory conditions and that for practical purposes the biological activity of carotene so defined has to be divided by 3 or 4.—I am, etc.,

London, N.W.3. A. L. BACHARACH.

Duodenal Ulcer and Priority Foods

SIR,—I think Dr. A. H. Morley (Nov. 8, p. 745) is a little hard on his patients. While the milk ration for children remains so small, who knows what pressure is brought to bear on father to cultivate his gastric symptoms? I believe that gastric sufferers are given milk and eggs as it is assumed they are unable to eat meat. If the issue of milk certificates automatically cancelled meat and bacon rations it would cause no hardship to genuine sufferers and discourage others from renewing priorities unnecessarily.—I am, etc.,

E. Molesey, Surrey. E. M. COLLINS.

Belladonna Poisoning

SIR,—When it was my privilege—many years ago—to work under the late Dr. Hughlings Jackson at the London Hospital as his house-physician, several cases were contacted in which it was difficult to decide whether the patient was suffering from post-epileptic delirium or belladonna poisoning. Dr. Hughlings Jackson advised that in such cases of doubt a few drops of the patient's urine should be instilled into the eye of a cat, which is extremely sensitive to the drug. This was done; and on several occasions both then and since this procedure, by causing rapid dilatation of the cat's pupil, has proved valuable in determining the diagnosis. This simple help may not be generally known.—I am, etc.,

Manchester. WILLIAM COATES.

SIR,—I was interested in the case of belladonna poisoning reported by Drs. M. Hamilton and A. B. Sclare (Oct. 18, p. 611) because I am surprised such cases are rare, but chiefly because I suspect the aetiology of the reported case may have been similar to a "near miss" of my own. At all events such cases may serve as a timely warning to Service M.O.s, particularly the more recent entrants.

The incident which prompts me to write this occurred when I had been in the R.A.F. only a month or so. I had under my care an airman with symptoms of peptic ulceration, and ordered for him, in writing, a mixture of magnesium trisilicate (stock) to which should be added 10 min. (0.6 ml.) of tincture of belladonna per dose. The dispensing of this I left in the hands of an orderly. When I came to check the final mixture (which I may have neglected to do) I discovered that liquid extract of belladonna had been added instead of the tincture. Fortunately the patient did not receive any, but two points were brought home to me. First, it is unwise (and, as I later discovered, contrary to Air Force Regulations) to allow inexperienced and unskilled, albeit "keen," orderlies to carry out even simple dispensing. Personal dispensing will benefit both the patient and the half-forgotten pharmacology of the doctor. Secondly, of the tinctures commonly used in civilian practice many are replaced in the Services, presumably for reasons of economy, by liquid extracts with their lower maximum doses.—I am, etc.,

R. L. G., R.A.F.V.R.

Genetics and Science in the U.S.S.R.

SIR,—After the self-righteous indignation of the leading article entitled "Ourselves and the Russians" (Aug. 30, p. 339) I was surprised at the crude attack on Soviet science and scientists printed under the title "Genetics and Science in the U.S.S.R." (Oct. 18, p. 616). I do not wish to discuss the scientific pros and cons of the Soviet genetics controversy, but the totally inadequate account given in your article suggests that its author is either extraordinarily ill informed or determined not to do the matter justice. Up to the present one has been inclined to take the more charitable view that your reviewers of Soviet medicine tend to be but poorly briefed. An example is the surprising ignorance of your annotator who thought fit to review work on spinal pumping (July 12, p. 62) though unaware of the existence of an English translation of Speransky's work for no less than twelve years.

In the present case, however, this conclusion is hardly possible. Though no less than five and a half columns were lavished upon the article, a little under one and a half was devoted to an inadequate account of the scientific controversy, and the rest to a vicious attack on Soviet scientific honesty, with a lengthy and slavish reproduction of the totally unfounded allegations of Darlington. It is necessary to state most emphatically that there is not a shred of evidence produced by Darlington or anyone else to suggest either that the death of Vavilov was due to other than natural causes or that he or any other geneticist was at any time under detention. Not only is there no word of truth in these allegations, but those who made them had ample evidence to the contrary before them when they wrote. The monograph of Hudson and Richens to which you pay such tribute contains conclusive proof of the existence and active work of a large Mendelian school in the U.S.S.R. enjoying the full support of the Soviet Government. Furthermore, Zhebrak, the leader of this school, far from being subjected to a "heresy hunt" as you would have us believe, was in May of this year elected president of the Byelo-Russian Academy of Science and is head of the Moscow Agricultural Academy.

One is therefore forced to the conclusion that your article is nothing more than an attempt to blacken Soviet science and is inspired by a determined hostility which readily accepts any scurrilous fable without asking for proof, while at the same time ignoring facts that do not suit your book. In fact the criticisms of Radbil (*Meditsinsky Rabotnik*, July 3, 1947) do not now seem to be so wide of the mark. Nor is it sufficient, in order to protest your innocence, to produce a list of articles by Soviet authors which have appeared in the *B.M.J.* if these were all published during or immediately after the war. In those days the most unexpected people found it necessary to pay lip service to the contribution of a gallant ally, but it is by their subsequent behaviour that the sincerity of these people has been tested. Your own recent attitude has been characterized by a stony silence broken by an ill-informed annotation and two hostile quasi-political editorials. It is a pity that the objectivity and impartiality of Hudson and Richens, to which you pay tribute, cannot also be found in your own attitude. Instead it shows every evidence of the very thing to which you pretend to object—ideological motives obscuring scientific truth.—I am, etc.,

Taunton. J. R. HAWKINGS.

*** In view of the statements made by Dr. Hawkings we submitted his letter to Dr. Darlington, whose reply follows.—ED., *B.M.J.*

SIR,—The circumstances of the imprisonment and killing of Vavilov and other leading Russian biologists have been reported this year as follows: Darlington, C. D., *Discovery*, 1947, **8**, 40 (February); *Nineteenth Century*, 1947, **142**, 157 (September); *J. Heredity*, 1947, **38**, 143 (May). Th. Dobzhansky, "N. I. Vavilov, a Martyr of Genetics, 1887–1942," *J. Heredity*, 1947, **38**, 227 (August). Eric Ashby, *Manchester Guardian*, Nov. 1. These reports, disgraceful to the Soviet Government, have never been contradicted officially or unofficially from any Soviet source.

Your correspondent's denial of "scurrilous fables" does not therefore take us any further. We must continue to rely on

what is written in Russia rather than on what is said in Somerset. In this difficulty *Pravda*, I think, gives us what we need. On Sept. 2 the great Moscow journal attempted to answer my "slanders" and to show where genetics, and indeed science in general, stands in Russia. Its attempt was sufficiently convincing to have been quoted and discussed by the *Manchester Guardian* of Sept. 26 in England and the *Dagens Nyheter* of Nov. 4 in Sweden.

In its article entitled "Antipatriotic Acts in the Guise of 'Scientific' Criticism" (for whose translation I am indebted to Prof. Dobzhansky, of Columbia University) *Pravda* rebuked the Soviet geneticists Zhebrak and Dubinin for various offences: for believing that there is such a thing as "pure science" and a "single biology" for the world; for having the "*petit bourgeois* impertinence" to declare that Academician Lysenko was not rewarded by the Supreme Soviet for his success in genetics but only in agriculture; for having defamed their compatriot in "a foreign journal," one "which specializes in maligning Soviet scientists" (to wit, *Science*); and for having allied themselves in so doing with "Darlington, Sax, and other obscurantists from the reactionary capitalist camp" and with "open enemies of the Soviet people" such as Dobzhansky and Timoféeff-Ressovsky.

"A backward part of our Soviet intelligentsia," *Pravda* concludes, "still carries a slavish servility for bourgeois science," whose "rotten roots it is necessary to pull out decisively and pitilessly." Thus there is no denial that Russian geneticists have been put to death; there is merely a threat that the survivors will be pitilessly eradicated.

The *Manchester Guardian*, the *Dagens Nyheter*, Prof. Ashby, and I differ somewhat in our estimates of the seriousness of this threat to the open continuation of honest biological research in Russia. But none of us imagines that the threat is anything less than a matter of life and death for the individuals concerned.—I am, etc.,

John Innes Horticultural Institution. C. D. DARLINGTON.

SIR,—At first a Victorian reader of your leading article (Oct. 18, p. 616) might feel some doubt whether a non-medical subject bound to stir emotion were suitable for the columns of a medical journal, but reflection suggests that perhaps nowhere else can it be discussed usefully—I mean without pyrotechnic *displays* of emotions. Doctors, like other men, are swayed by emotion, but have been trained to control its expression. Before we can classify the deaths under discussion, say whether those who died *were* martyrs in the ordinary sense of the word, we must know whether Communism—by which I mean Russian Communism—is a religion. By religion I mean not the *religio* of Lucretius—viz., fear of the "gods"—but faith in "the eternal not ourselves which makes for righteousness"—Matthew Arnold's definition of God.

In Prof. Arthur Rosenberg's *History of Bolshevism* (O.U.P., 1934, pp. 6–7) we read:

"He (*sc.* Hegel) believed in an incessant spiritual progress that was always in opposition to itself. Each appearance of the world-spirit (*Weltgeist*) at a definite period in history of necessity gave rise to opposition. It was out of the conflict of power with power that a new and third force was born. This dialectic method when applied by Hegel to his own age clearly taught that the thesis (middle-class society) must be overcome by the antithesis (proletariat) in order to prepare the way for the new synthesis. . . . Only the world-spirit itself is absolute in its eternal progression. In these ideas of Hegel are to be found the chief elements composing Marx's materialistic conception of history."

My first question, directed to those readers who have studied Hegel, is whether Prof. Rosenberg has correctly summarized Hegel's position. The summary seems to imply that Hegel foresaw an infinite succession of conflicts—viz., that the proletarian triumph must yield to another antithesis, the triumph of which would give place to another and so forth. My next question is, do Marxians adopt this philosophy or do they regard the triumph of the proletarian antithesis producing a classless society as definitive, in fact very much as Christians regard the second coming of Christ? If they do, Communism is a religion and a religion implies heretics. If they do not, the question of martyrs does not arise, although there may be other questions we could usefully discuss.—I am, etc.,

MAJOR GREENWOOD.

SIR,—Reading the leading article on "Genetics and Science in the U.S.S.R." (Oct. 18, p. 616) I was uncomfortably reminded of the Russian accusation "sham political neutrality of the *B.M.J.*," which was so indignantly denied by you in the *Journal* of Aug. 30 (p. 339). Can it be that the accusation was, after all, correct in essence, if not in detail?

In the autumn number of the *Modern Quarterly* you will find two articles and an editorial footnote devoted to the genetics controversy in the Soviet Union. Two of the writers, geneticists working with the School of Agriculture in Cambridge, while themselves dismissing Lysenko's theory as worthless and regretting the official favour enjoyed by it, make it clear that flourishing schools of orthodox genetics exist and are in fact increasing in importance. And as for the alleged persecution of the Mendelian geneticists, the footnote points out that "Zhebrak, Lysenko's chief opponent, far from being liquidated . . . is very much alive and has just been made President of the Byelo-Russian Academy of Science and is head of the Moscow Agricultural Academy (*Moscow News*, May 17, 1947)."

It seems most regrettable that the *B.M.J.* should lay itself open to a charge of political bias by quoting mischievous rumour from a daily paper without taking the trouble to verify the facts.—I am, etc.,

Birmingham, 15. C. BACHTIN.

*** The "mischievous rumour" was taken from *Pravda* of Sept. 2, 1947, and has been verified.—ED., *B.M.J.*

SIR,—The correspondents who have written to you concerning your fair and enlightened leading article, "Genetics and Science in the U.S.S.R." (Oct. 18, p. 616), will find complete answers to their idiotic criticisms in a book *I Chose Freedom* (Hale) just published. It is the political history of a high Russian official, Victor Kravchenko.

You rightly say that "Darlington has done a great service to truth in putting these facts on record." The same applies to Kravchenko about the gruesome facts he also has put on record.—I am, etc.,

T. GERALD GARRY.

SIR,—I was extremely grateful for your courageous leading article on "Genetics and Science in the U.S.S.R." (Oct. 18, p. 616). It is high time that such facts, which have long been available, be made more widely known in face of the pressure to which scientific workers are treated in the way of propagandizing the Soviet Union as the scientist's paradise. The protesting chorus of the faithful may be met, if you will permit me, by invoking a favourite "dialectical" platitude, that art, philosophy, and science are all determined by the form of society in which they are produced, and that, as may be anticipated from this, science is not the only intellectual activity in the U.S.S.R. tyrannized by a mediaeval Inquisition modernized with Gestapo technique.

One may quote the outlawing of psycho-analysis, the imposition of so-called Socialist Realism in art, and the subsequent sudden eclipse of writers and artists who fail to express the "forward march," "aspirations," etc., of "the masses," or who allow "degenerate" bourgeois themes to steal into their symphonies. Recently Shostakovitch, the composer, and Eisenstein, the tragic film director—once a leading figure in cinema art—have again performed the nauseating public breast-beating ritual for their "deviations," the new synonym for heresy, and this alone should make your correspondent, who refers to the *B.M.J.* article as "simply another set-piece of anti-Soviet pyrotechnics," squirm; and, if this does not, perhaps the fact that many more artists who are less known perform their confession in the decent privacy provided by the N.K.V.D. will.

One further illustration of the attitude to truth of the Soviet ruling class and its adherents elsewhere is the suppression of the official *History of the Soviet Revolution*. In the Soviet Union itself every available copy was withdrawn and a new version issued in which history was turned on its head, Lenin's "general staff of the revolution" portrayed as counter-revolutionary "mad-dogs," Trotsky, the founder of the Red Army, becoming the arch-saboteur. As far as possible, even the surviving witnesses of historic events were liquidated together with archivists of the Marx–Engels–Lenin Institute in Moscow. In

this country one may still pick up John Reed's stirring account of the revolution, *Ten Days that Shook the World*, which was approved by Lenin, who wrote a foreword to it; yet it is, in the U.S.S.R. and to members of Communist parties elsewhere, a banned book, on the "Index Expurgatorius." The reason is simple: Trotsky is mentioned honourably on every page, Stalin once—as the signatory to a document.

The scientific method, objectivity, and culture as we understand the terms can no more survive in this atmosphere than in Nazi Germany, and they have not flourished so long here that we can afford to be lax in guarding them jealously.—I am, etc.,

Virginia Water Surrey. HAROLD BOURNE.

*** This correspondence is now closed.—ED., *B.M.J.*

Treatment of Varicose Veins

SIR,—It was with some consternation that I read Dr. R. Simpson Harvey's letter (Nov. 15, p. 793) referring to my method of sclerosing varicose veins by mechanical scarification of the intima (Oct. 25, p. 671) as "barbarous." I have no knowledge of the treatment of varicose veins in barbarian communities, but if he means to infer that the method is cruel to the patient I can reassure him on this point.

The bulk of my cases are done under local analgesia to the incision in the groin (or behind the knee in the case of the external saphena) after usual morphine–scopolamine premedication. About one-third of the patients give no indication that they feel anything; the rest respond with varying degree by movement of the limb operated on, but a little reassurance is all that is necessary to get them to submit with good grace to "scraping" of the vein. The discomfort caused by this method is not to be compared with the painful cramps which follow sclerosing injections with salicylates or sodium chloride.—I am, etc.,

Birmingham. J. W. RIDDOCH.

A Word of Praise

SIR,—For thirty-five years, rain or shine, in sickness or in health, for better or for worse, I have not missed reading the *Journal* each week (for a number of years, as you know, it was a duty as well as a pleasure), and I should like to tell you that I have never seen a better number than this week's with the Sherrington symposium. It would perhaps be rash to call it the very best number, but I repeat that I do not remember a better—not primarily because of the excellent articles about Sir Charles Sherrington (I am, alas! but little of a neurologist) but because, in these days when politics overwhelm us all, in and out of the medical profession, it is so refreshing to find in a weekly newspaper the pure light of science held aloft as a beacon for us doctors.

I admire, too, the technical skill with which the *Journal* is produced, with something in it for everyone (including the medical politicians), from "Synchronous Combined Total Gastrectomy" to "Jugged Hair," the evident authority in the leading articles and the variety in the thirty-three letters to the editor—the life-blood of any weekly journal. In these days of paper restrictions and production difficulties I hope, Sir, that you will allow me to give you and your staff a public word of well-merited praise.—I am, etc.,

London, W.1. R. SCOTT STEVENSON.

POINTS FROM LETTERS

Bodies for Dissection

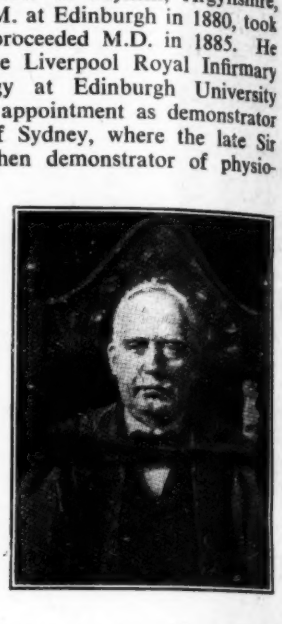
DR MURIEL KEYES (Harrogate) writes: "D. M. A." (Oct. 11, p. 590) suggests a "Body Donors' Society." Until such be formed it is so simple to bequeath oneself by will to a particular medical school, with the proviso that if distance at time of death make this impracticable then it be offered to the *nearest* school. An important point is, do the schools prefer us fresh or pickled? Modern embalming by qualified morticians is reasonable in cost and facilitates transport. I believe both Guy's and Liverpool have used bodies so preserved, and I understand that, if so desired, embalming can be followed later by the customary pickling tank. It does not seem generally known how helpful embalming is in ordinary practice. Particularly in cases of unexpected death, relatives who have had to travel from afar have been most grateful to find the face with contour and colouring as they last knew it, and a perfect-looking body with, of course, no suggestion of decomposition.

Obituary

SIR ALEXANDER MACCORMICK, K.C.M.G., M.D., F.R.C.S.

Sir Alexander MacCormick died on Oct. 25 at his Jersey home, where he had retired after an unusually long career in Sydney in order to be near his children and grandchildren. He was 91, and well known as a surgeon in this country and in Australia.

Alexander MacCormick was born at Taynish, Argyllshire, in 1856. He graduated M.B., C.M. at Edinburgh in 1880, took the M.R.C.S. a year later, and proceeded M.D. in 1885. He had been a house-surgeon at the Liverpool Royal Infirmary and demonstrator in physiology at Edinburgh University before he took up, in 1883, his appointment as demonstrator of anatomy at the University of Sydney, where the late Sir Thomas Anderson Stuart was then demonstrator of physiology. MacCormick was later elected to the surgical staff of the Royal Prince Alfred Hospital and St. Vincent's Hospital, Sydney. He was also consulting surgeon to the St. Vincent Hospital and the Coast Hospital, Little Bay. He was one of the founders of the Royal Australasian College of Surgeons, and he was made an honorary fellow of the Royal College of Surgeons of England in 1900 and of the Edinburgh College in 1905. He was mentioned in dispatches for his services as consulting surgeon with the British Army in the South African War, and he was knighted in 1913. He served in France as a consulting surgeon with the rank of colonel in the 1914–18 war, when he lost his eldest son, Campbell, who was an officer in the Argyll and Sutherland Highlanders. MacCormick had always hoped that Campbell would succeed him at "The Terraces." He was created K.C.M.G. in 1926.



The work of MacCormick and Anderson Stuart was epoch-making in the medical school of the University of Sydney. Anderson Stuart was a great administrator and a great dean of the medical faculty, as well as an able physiologist. McCormick excelled as an anatomist and as a surgeon, and he was soon appointed lecturer in surgery to the University. Sixty years ago the splitting of surgery into specialties had scarcely begun, and forty years ago, when the older members of the present generation began to know MacCormick well, one would find on his afternoon's operation list at Prince Alfred Hospital a wide range of cases: a cerebral case; a knee-joint; a stomach, gall-bladder, or renal case (or all three); almost always a case of hydatid disease; frequently a carcinoma of the breast, or of the tongue with deposits in the glands of the neck; or a mastoid. One instance of his thoroughness may be given. He had operated upon a patient for epithelioma of the lip, with very extensive glandular involvement. Later there was a recurrence, and the patient stated that he would commit suicide if something more could not be done. MacCormick operated again, but after the metastases had been eradicated the pharynx could not be closed and the skin had to be sutured to the pharyngeal mucous membrane. The patient lived subsequently for twenty years, with his arytenoids and larynx in full view through the pharyngeal window. It was on this patient that Anderson Stuart worked out the mechanism of swallowing. When the patient wanted to swallow a meal he closed the opening by covering it.

Modern methods of confirming diagnosis had not reached their present dependable position at the time when MacCormick started active practice, but his clinical knowledge was unusually sound, his diagnosis shrewd and penetrating. In the operating-theatre his practical knowledge of anatomy together with his skill made his approach appear easy. His technique was devoid of hurry, but his precision was such that operations were

finished cleanly and quickly. It was an especial pleasure to watch his breast operations. Quickly displaying the distal part of the brachial plexus, he cleaned the axillary artery and vein from below upwards, using his own double-ended dissector —one end plain for dissection, the other carrying a ligature. Each tributary vessel was cleaned, ligated, and divided with a technique peculiarly his own; he left a dry dissection behind and advanced on a level front until the axilla was completely cleaned. The extensive dissection of the neck for neglected carcinoma of the tongue, which was all too frequent then, was carried out in the same precise, purposeful manner. In those days private hospitals scarcely existed. Traffic was horse-drawn and big distances had to be covered. MacCormick would perform a fore-quarter amputation, or any other operation, under conditions which were often primitive and with inadequate lighting. Because of this he built his own private hospital, "The Terraces," and thereafter worked in comfort. He appeared to be quite inexhaustible. He arrived at "The Terraces" at 6.30 a.m. and began operating at 7 a.m.; his operations at Prince Alfred Hospital or at the Coast Hospital in the afternoon started at 1.30 p.m. and might go on until after dinner.

He retired from the Prince Alfred Hospital at the age of 65, but he continued to operate for several years more at St. Vincent's Hospital. His mental alertness at the age of 90 is shown by one incident. Knowing that he would enjoy it, the British Council gave a private showing of a recent film. When the pathologist appeared on the screen and made the statement, "It is a squamous-cell carcinoma of the bronchus," quick as thought MacCormick whispered, "How does a squamous-cell carcinoma occur in a bronchus?" He wrote little compared with the vast amount and high quality of his work, but he was responsible for a treatise on the myology of the wild cat and for a number of papers on, for example, cystotomy. Being a canny Scot with unusual business ability, he was in request for the boards of insurance and other companies. He read deeply. His hobby was yachting, and at the age of 73, with two friends of almost the same age and a crew, he sailed his 60-ton yacht from England to Sydney by way of the Panama Canal. His portrait, here reproduced, was painted by John Longstaff and unveiled by H.R.H. the Duke of York in the Great Hall of Sydney University on March 29, 1927. He married in 1895 Miss Ada Cropper, who survives him with his second son and two daughters.

CYRIL STRICKLAND, M.D.

Dr. Cyril Strickland, who died at the age of 66 on Nov. 3 in Jersey after a long illness, was born in Port Elizabeth, Cape Colony, in 1881. He was educated at St. Andrew's College, Grahamstown, Oundle School, and Caius College. He graduated at Cambridge with first-class honours in 1902. While he was at St. Bartholomew's Hospital he accepted an invitation to study protozoology at Cambridge under Prof. G. H. F. Nuttall, whose assistant he became. In that capacity he made the interesting discovery that the trypanosomiasis of rats was normally transmitted from rat to rat by the ingestion of infected fleas which were caught and masticated by the animals. Previously it had been assumed that transmission was by the bites of the insects. During this period he found time to take his degree in medicine.

In 1912 he was appointed by the Federated Malay States Government to a post connected with malaria control. Sir Malcolm Watson had already achieved remarkable success in the prevention of malaria by drainage in the low-lying coastal land, but the disease in the jungle upland areas was still a baffling problem. In 1915 Strickland announced the discovery that the hill jungle of Malaya remained free from malaria till clearing operations made the watercourses and pools suitable as breeding-places for the vector mosquitoes. The importance of this discovery was recognized by the Government, which issued an order that jungle must not be cut down close to water collections without an official permit. In India Sir Pardey Lukis, writing in the *Indian Journal of Medical Research*, referred to this work as a "brilliant discovery." Despite this recognition Strickland ever since that time harboured a sense of grievance because of the inadequate acknowledgment accorded to him for so far-reaching an advance in malaria-control methods.

After a short spell of military duty with the New Zealand forces Strickland went to India, where he was employed in work on the prevention of plague till 1922, when he was appointed to the newly established professorship of medical entomology at the Calcutta School of Tropical Medicine and Hygiene. He held this post for seventeen years, and in his own words "during this long period his heart was always in the prevention of malaria by the utilization of his discovery in Malaya, and as far as the tea-gardens of Assam and North Bengal went he had considerable success. A large number of tea-garden doctors took up the story, aided by the great Agency Houses of Calcutta and the estate managers, until the tea-gardens became comparative health resorts, mainly by the use of jungle over the malariogenic waterways."

In addition to his other fruitful work in teaching and research Strickland made a special study of the association between the formation of deltaic areas and malaria. In 1939 he published a book, *Deltaic Formation*, in which he dealt specially with the deltas of the Ganges and Brahmaputra rivers. He contemplated further work on this subject, especially a correlation of the vast amount of data that he had collected in connexion with the incidence of malaria in Eastern India, but this task was never completed because of his superannuation in 1939. He was then employed by the Army till 1942 in organizing malaria work with special reference to the anticipated Burma campaign.

Dr. GEORGE CLEMENS SCHWIZER was fatally injured in a car accident on Oct. 21. Born in 1903, Schwizer qualified in his native city of Vienna in 1929. After holding several house appointments, one of them under von Eiselsberg, he settled in a small town on the Danube as a general practitioner and surgeon. A Roman Catholic of Jewish descent, he had to leave Austria abruptly in 1938. He came to England and took the conjoint diploma in 1941. After a short spell in general practice he accepted a post as industrial medical officer with the Shell Refinery at Port Ellesmere. There he spared no effort and used all his knowledge and experience in creating a model medical department.—H. G. K.

Dr. DAVID DAVEY ROSEWARNE died suddenly on Nov. 4. A robust New Zealander, he played rugby for St. Mary's Hospital, and after being house-physician there he served in the R.A.M.C. in the 1914–18 war, and then took up practice in East London. His humanity, humour, and hard work, combined with an extensive knowledge of medicine and an intolerance of shams, soon ensured him a large practice. He was one of a rota of doctors who remained permanently on duty throughout the recent war and the blitz, often sleeping in a church crypt. He leaves a widow, his son, Dr. D. D. Rosewarne, and a grandson.—F. S.

The Services

The President of the U.S.A. has conferred the following decorations in recognition of distinguished services in the cause of the Allies:

Legion of Merit, Degree of Commander.—Lieutenant-General Sir Alexander Hood, G.B.E., K.C.B., K.H.P., late R.A.M.C.

Legion of Merit, Degree of Officer.—Major-General R. E. Barnsley, C.B., M.C., K.H.S., late R.A.M.C.; Major-General Sir P. S. Tomlinson, K.B.E., C.B., D.S.O., Colonel Commandant, R.A.M.C.; Brigadier (Temporary) E. C. Beddows, O.B.E., M.C., late R.A.M.C.; Colonels (Temporary) E. Bulmer, O.B.E., and A. E. Porritt, C.B.E., and Colonel (local) T. J. L. Thompson, O.B.E., M.C., R.A.M.C.

Legion of Merit, Degree of Legionnaire.—Colonel (Temporary) J. P. Douglas, M.B.E., R.A.M.C.

Bronze Star Medal.—Major D. H. Thompson, O.B.E., and Captain G. Forrest-Hay, R.A.M.C.

The President of the Czechoslovak Republic has conferred the Medal of Merit 1st Class upon Air Commodores E. D. D. Dickson, C.B.E., and P. C. Livingston, C.B.E., A.F.C., R.A.F., in recognition of valuable services rendered in connexion with the war.

The Efficiency Decoration has been conferred upon the following officers of the Territorial Army: Lieutenant-Colonel (Honorary Colonel) E. N. P. Martland, Lieutenant-Colonel D. A. McM. Crawford, O.B.E., Majors (Honorary Lieutenant-Colonels) J. E. Flood, D. M. Mitchell, and G. M. Warrack, D.S.O., O.B.E., Majors W. N. S. Donaldson and M. W. Gonin, D.S.O., and Captain (Honorary Major) D. Arnott, R.A.M.C.

Medical Notes in Parliament

Medical Practitioners and Pharmacists Bill

Lord HENDERSON, in the House of Lords on Nov. 11, moved the Second Reading of this Bill, which, he said, was intended to dispose of wartime problems associated with the British medical registration of doctors not possessing British qualifications. It also dealt with pharmacists qualified abroad. The Medical Act of 1886 laid down that admission to the *Medical Register* of doctors holding only diplomas obtained abroad should be conditional upon the existence of reciprocal arrangements. The only foreign countries with which reciprocal arrangements were made were Belgium, Italy, and Japan, and these were cancelled in 1920, 1940, and 1942 respectively. When the war came and doctors from all parts of the world found their way to this country some temporary amendment of the law was called for and was effected in July, 1940, by Defence Regulation 32B, which empowered the General Medical Council to register practitioners qualified to practise outside the United Kingdom. By the time temporary legislation ceased nationals of twenty-six countries had been registered by virtue of foreign diplomas. Independent practice was not permitted, but the help given by these doctors was substantial and a large number served with H.M. Forces or those of allies, while many gave valuable service in hospitals, in the public health services of local authorities, or as assistants in general practice. No further grant of temporary registration was made after February, 1946, but doctors already registered remained so till the end of 1947. The Bill proposed that those who remained in this country and who had given good service in the Forces or in civilian life could obtain permanent registration. When temporary registration ceased there were about 3,500 on the *Register*, including many American and Canadian doctors. Of the others, Germans, Austrians, Poles, and Czechs were the largest classes. It was estimated that not more than 1,500 to 2,000 would avail themselves of the Bill. The figure might be much less, and it would include Polish doctors who had come to this country under the Polish resettlement scheme. The Bill also provided for certain groups who were not registered at all: foreign doctors who had served overseas with British forces and were allowed to enter and remain in the United Kingdom; and doctors who were allowed to enter or remain here during the war but had not been employed in forms of medical work specified in the temporary registration orders. Some had given the country useful service in medical research. This group would include graduates of the Polish school of medicine. It was proposed that for this group registration should in the first place be provisional. During the provisional period they would be required to work in hospitals or other institutions under supervision to enable the General Medical Council to judge their suitability for permanent registration. This provision would be limited to doctors who were in the country when the Bill was introduced. Any question of permanently modifying the general laws which made the registration of foreign doctors dependent on reciprocity would be beyond the intention of the Bill. Clause 8 of Part 1 contained the only provision which would be permanent. Its purpose was to regularize the position of doctors from abroad who visited this country for limited periods to do professional work in hospitals as teachers or as postgraduate students. Many of these visitors were not eligible for registration under the Act of 1886, and it was undesirable that there should be any doubt on the propriety of a registered practitioner co-operating with one of these distinguished visitors. A second group to be covered by this Clause were doctors qualified abroad who came to this country to continue their professional education in temporary appointments at hospitals. The desirable practice of exchanging doctors with the Dominions was in some cases made difficult by the absence of registration. Even if no legal difficulties had arisen in the past the risk had been there and should be removed, especially as hospitals would soon become a State responsibility. Registration would be for the duration of the appointment and only in respect of the appointment, and the Bill gave the General Medical Council the task of assessing the value of medical diplomas held by applicants under the Bill. Part 2 of the Bill changed the law on the registration of pharmacists holding qualifications obtained abroad and also provided for foreign qualified pharmacists.

Lord LLEWELLIN, on behalf of the Conservative Opposition, welcomed the Bill. Lord ALTRINCHAM pointed out that Clause 8, subsection 3, laid down that those who were to be given temporary recognition must hold a colonial or a foreign diploma. If the word colonial was intended to cover the Dominions it was an improper description and should be altered. Lord HENDERSON promised to look into this and other points, and the Bill was read a second time.

Committee Stage

The Bill was taken in Committee of the whole House on Nov. 18. On Clause 1 Lord HENDERSON moved to leave out "colonial" and to insert "commonwealth." Since 1886 the *Register* had included separate lists for colonial and foreign practitioners. The unsuitability of the word to present-day conditions was obvious. This amendment and subsequent ones proposed the use of "commonwealth" and would thus achieve the intention of the Bill without offending the Dominions. The House agreed to the amendment. Meeting a point made previously by Lord Llewellin, Lord Henderson then moved that the House accept an amendment making subsection 5 of Clause 1 read that direction shall be given only in the case of a person who is resident in the United Kingdom and who is resident therein otherwise than for a temporary purpose.

On Clause 4 Lord Henderson moved an amendment to meet the case of a number of Polish doctors—there were 43 of them—who were not registered and who were still awaiting transfer to this country; they might not arrive by the end of the year. The amendment was accepted. Lord Henderson also accepted an amendment by Lord Llewellin to extend to "other institutions" the provision for the registration of commonwealth or foreign practitioners temporarily employed in British hospitals. Lord Henderson moved to insert a new clause after Clause 8, substituting "commonwealth" for "colonial" in Part 2 of the Medical Act, 1886. The House agreed to this.

The remaining Clause of the Bill was agreed to and the Committee Stage concluded. The Report Stage was put down for Nov. 25.

Venereal Disease in the Army

Mr. SHINWELL furnished the following table showing the incidence of venereal disease among British troops during the twelve months ended June 30, 1947.

Annual rates per 100 *strength*

	Officers	Other Ranks	Women's Services
United Kingdom	0·4	2·8	1·0 (*e*)
British Army of the Rhine	1·9	16·8	1·2 (*e*)
Central Mediterranean Force (*a*)	1·8	13·3	
British Troops in Austria (*b*)	1·2	15·2	Not available
Middle East Land Forces (*c*)	0·6	3·0	
Far East Land Forces	4·1	13·9	
British Commonwealth Occupation Force (Japan) (*d*)	1·6	30·9	

(*a*) Includes Austria up to the end of 1946.
(*b*) Estimated annual rate based on the first 6 months of 1947.
(*c*) Includes Malta and East Africa from April 1, 1947.
(*d*) The number of British troops in this Command is small; accordingly the percentage rate is liable to fluctuate considerably.
(*e*) Officers and other ranks: separate figures for the two categories are not available. As far as is known, however, there were no cases among officers of the Women's Services during this period.

Cancer Research

Mr. HERBERT MORRISON said on Nov. 20 that expenditure on cancer research from the Parliamentary grant-in-aid for the work of the Medical Research Council had been at the rate of approximately £6,000 per annum during the greater part of the last twenty years, this provision being supplementary to the much larger expenditure from the endowments and other resources of unofficial organizations concerned with this particular field. Expenditure from the same source in the financial year 1946–7 was about £12,000, and expenditure in the present financial year was estimated at £31,000 (including £14,000 of a non-recurrent nature). Substantial additional expenditure in the future had been approved for research on the application of atomic physics to the treatment of cancer. These activities were not affected by the National Health Service Act, 1946.

Mr. FREEMAN asked if Mr. Morrison knew that deaths from cancer had increased during all this period. He asked whether the Minister was satisfied that the most satisfactory method was applied in allocating the money. Mr. MORRISON said the allocation was the best which could be done. He shared Mr. Freeman's disappointment that the problem had not been solved.

Mr. SOMERVILLE HASTINGS asked whether the sum Mr. Morrison had mentioned sufficed for the legitimate demands of those engaged in this research. Mr. MORRISON said he thought that it met the needs of the useful activities which could be conducted.

Considerable sums were spent elsewhere in the field of research under the Ministry of Health and the hospitals. He would consider further developments in expenditure if useful avenues of research were available.

Lord WINTERTON said that in the opinion of laymen, of hospital authorities, and of the highest members of the medical profession the money in question was being admirably spent. Mr. MORRISON replied that this was his impression.

Dr. MORGAN asked Mr. Morrison to review the evidence on a substance called H 11 which had been used in private research work and to see whether it could be obtained at less cost. Mr. MORRISON said that if he were given particulars he would make inquiries. Sir CHARLES MACANDREW, as a member of the Medical Research Council, said the difficulty was not to secure money, but research experts. He added that the Medical Research Council knew all about H 11. (A leading article on H 11 and papers by H. A. Kidd and by W. E. Gye, R. J. Ludford, and Hilda Barlow appeared in our issue of July 17, 1943.)

Hospital Contracts.—Mr. DE LA BERE asked on Nov. 18 whether all contracts made by hospitals would be honoured by the Ministry of Health when the hospitals were taken over. Mr. BEVAN replied that rights and liabilities under contracts made for carrying on the work of a hospital transferable under the National Health Service Act were themselves transferable under Section 6 of the Act.

Mental Defectives.—Mr. BEVAN stated on Nov. 20 that premises acquired by local authorities will provide 160 beds for mental defectives in the immediate future. Further accommodation will be available in the new year in three mental deficiency colonies released by Service Departments. Mental defectives awaiting institutional accommodation were 3,890 on Jan. 1, 1947.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

John Henry Dean, M.B., B.Chir., has been appointed University Assistant Pathologist to Addenbrooke's Hospital for three years from Oct. 1.

The degree of M.D. was conferred on E. B. Jarrett and N. D. Compston on Nov. 15.

UNIVERSITY OF ABERDEEN

In announcing the appointment of Dr. John Craig as the new Professor of Child Health in the University (Nov. 8, p. 753) we wrongly described him as M.R.C.O.G.

Dr. James Walker has been appointed Lecturer in Midwifery and Gynaecology in the University.

UNIVERSITY OF WALES

The following candidates for the degrees of M.B., B.Ch. at the Welsh National School of Medicine have satisfied the examiners at the examinations indicated:

PATHOLOGY AND BACTERIOLOGY.—G. J. Davies, H. E. F. Davies, F. J. Davis, D. M. D. King, J. D. Thomas.

HYGIENE.—Maureen M. Bassett, N. V. Chivers, S. I. Cohen, A. V. Coleman, D. P. Davies, G. J. Davies, *H. E. F. Davies, F. J. Davis, Joan V. Davis, E. H. Evans, E. F. Griffiths, Anne Guy, E. J. Hargadon, J. M. E. Hyde, E. G. A. Jackson, Marjorie L. James, J. H. Jones, T. D. Jones, D. M. D. King, R. H. Lewis, Joan A. McLay, Lilian M. Morgan, M. A. Owen, E. G. Rees, G. M. Reynolds, Frances M. Richards, J. M. Richards, Sybil H. Stephens, *C. E. Stroud, Mary C. Sumption, Augusta J. Taylor, G. Thomas, J. H. S. Wakelin, J. A. Wilkinson.

* With distinction.

UNIVERSITY OF LIVERPOOL

Thomas Cecil Gray, M.D., D.A., has been appointed to the newly established whole-time Readership in Anaesthesia in the University. He will organize the teaching of undergraduates and graduates and engage in research.

UNIVERSITY OF SHEFFIELD

Harry Norman Green, M.D., professor of pathology in the University, has been granted the additional title of Director of Cancer Research.

The Council of the University has received the resignation of John Rennie, M.D., of the post of professor of public health on his retirement from the position of medical officer of health for the City of Sheffield, and has thanked Dr. Rennie for his services to the University.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

Owing to the rise in costs it has been found necessary to increase the charge for the monthly College dinners from £1 1s. to £1 5s. (including drinks). The new charge will come into force from Jan. 1, 1948.

At an ordinary meeting of the Council of the College, held on Nov. 13, with Sir Alfred Webb-Johnson, Bt., President, in the chair, a Loyal Address in connexion with the impending marriage of H.R.H. The Princess Elizabeth was adopted.

Mr. James M. Wyatt was admitted as a co-opted Member of the Council.

Mr. H. S. Souttar was appointed Hunterian Orator and Mr. L. E. C. Norbury, Bradshaw Lecturer.

The Hallett Prize was awarded to David Henry Cave Harland (St. Bartholomew's).

The following were elected Fellows in Dental Surgery of the College: Sir Frank Colyer, Prof. E. C. Sprawson, Colonel E. B. Dowsett, Mr. Frank Coleman, Mr. T. W. Widdowson, Mr. F. N. Doubleday, Mr. J. H. Badcock, Mr. Wm. Warwick James, Mr. J. G. Turner, Dr. Lilian Lindsay, Mr. A. E. Rowlett, Mr. Bryan J. Wood, Mr. C. S. Morris, Mr. Harold Round, Brigadier R. A. Broderick, and Mr. J. Sim Wallace.

Dr. R. J. Last, Anatomical Curator, was reappointed Bland-Sutton Scholar for a further year; Dr. F. S. Gorrill was appointed Anatomical Curator and Lecturer in Anatomy; and Dr. B. Schofield was appointed Lecturer in Physiology.

Leverhulme Scholarships were awarded to Mr. E. S. R. Hughes for research into spontaneous thrombosis of the axillary vein and to Mr. H. Daintree Johnson for research into gastric physiology in relation to surgery and cardiovascular surgery, particularly in relation to portal hypertension.

The following hospitals were recognized in respect of the resident surgical posts required of candidates for the Final Fellowship examination: Chase Farm Hospital (two assistant surgeons, four senior house-surgeons, and one casualty officer); City General Hospital, Leicester (resident surgical officer and two house-surgeons); Luton and Dunstable Hospital (casualty house-surgeon and orthopaedic house-surgeon); Churchill Hospital, Headington (one house-surgeon (B2)); Scunthorpe and District Hospital (resident surgical officer and orthopaedic house-surgeon).

Diplomas

Diplomas of Membership were granted to D. J. Parr and J. C. E. Pougher and to the 129 successful candidates whose names were printed in the report of the meeting of the Royal College of Physicians of London in the *Journal* of Nov. 15 (p. 800); as were the names of the successful candidates for the Diplomas in Child Health and in Medical Radio-Diagnosis.

Diplomas in Medical Radiotherapy were granted to D. K. Sambrook and to the other successful candidates whose names were printed in the report of the meeting of the Royal College of Physicians of London in the *Journal* of Nov. 15 (p. 800).

Diplomas in Physical Medicine were granted, jointly with the Royal College of Physicians of London, to W. R. Grant and A. K. Tyler, and a Diploma in Ophthalmic Medicine and Surgery, also jointly, to E. Hefferman.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW

Dr. William Evans, F.R.C.P., will deliver the Finlayson Memorial Lecture in the Hall of the Faculty (242, St. Vincent Street, Glasgow) on Wednesday, Dec. 3, at 5 p.m. The title of the lecture is "Heart Murmurs." All medical practitioners are invited to attend.

ROYAL COLLEGE OF PHYSICIANS OF IRELAND

At a meeting of the President and Fellows of the College on Nov. 7 the following were admitted to the Membership: T. J. Ryan, J. W. Magner, M. Millard, G. A. C. Miller.

CONJOINT BOARD IN SCOTLAND

The following candidates, having passed the final examinations, have been granted the diploma of L.R.C.P.Ed., L.R.C.S.Ed., L.R.F.P.&S.Glasg.: A. Alakija, J. M. Brownlie, L. Charles, W. J. C. Colin-Thome, R. S. Cowie, A. M. Darwish, T. P. Edwards, P. H. T. Fok, S. Gordon, J. A. Gray, W. S. Hall, M. Harris, Patricia E. Hartley, J. M. Hillock, E. Katz, D. P. Keith, S. Lipson, M. Lloyd-Jones, P. Macpherson, Hilary E. C. Millar, H. G. C. Payne, A. I. Richardson, J. R. Scott, Joan C. R. Shiell, H. Simmons, H. S. Sloane, J. D. Stewart.

No. 45

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended Nov. 8.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1947 (a)	(b)	(c)	(d)	(e)	1946 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	39	3	23	2	—	46	4	25	2	3
Deaths		1	1				—	—		
Diphtheria	219	21	55	24	6	314	20	88	30	6
Deaths	5	1	2	—	—	2	—	1	1	—
Dysentery	105	4	21	—	—	65	13	48	1	—
Deaths				—	—				—	—
Encephalitis lethargica, acute	1	—	1	—	—	2	1	1	—	—
Deaths		1					1			
Erysipelas			41	8	4			47	4	5
Deaths		—					—			
Infective enteritis or diarrhoea under 2 years				68					59	
Deaths	61	3	22	17	4	57	5	7	8	4
Measles*	2,179	72	191	205	7	3,987	157	231	65	23
Deaths	1	—	1	1	—	—	—	—	—	—
Ophthalmia neonatorum	54	3	9	—	—	57	7	24	1	—
Deaths										
Paratyphoid fever	6	2	—	—	—	30	2	1 (B)	1 (A)	—
Deaths	—	—	—	—	—	—	—	—	—	—
Pneumonia, influenzal	571	44	3	2	1	601	29	11	2	11
Deaths (from influenza)†	14	2	—	2	—	16	2	4	—	—
Pneumonia, primary			305	23				276	15	
Deaths		43		8	10		49			7
Polio-encephalitis, acute	12	1				1	—			
Deaths		—					—			
Poliomyelitis, acute	198	16	39	12	7	21	—	—	17	1
Deaths		1					1			
Puerperal fever		1	20		—		1	18		—
Deaths										
Puerperal pyrexia‡	107	8	9	1	1	125	10	13	—	—
Deaths		—					—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,730	116	296	57	63	1,323	110	319	31	41
Deaths	—	—	—	—	—	2	—	—	—	—
Smallpox	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Typhoid fever	9	2	—	4	—	5	—	—	1	9
Deaths	1	—	—	—	—	1	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Whooping-cough*	1,072	73	46	30	3	1,590	74	166	32	40
Deaths	1	1	—	—	—	8	—	2	—	3
Deaths (0–1 year)	321	40	52	33	15	382	43	78	23	21
Infant mortality rate (per 1,000 live births)										
Deaths (excluding stillbirths)	4,569	771	618	170	126	4,729	742	643	175	135
Annual death rate (per 1,000 persons living)			12·8	10·7				14·2		
Live births	7,869	1292	924	401	240	9,118	1425	1120	350	260
Annual rate per 1,000 persons living			18·6	25·3				22·5		
Stillbirths	186	29	24			262	26	45		
Rate per 1,000 total births (including stillborn)			25					39		

* Measles and whooping-cough are not notifiable in Scotland, and the returns are therefore an approximation only.

† Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

‡ Includes puerperal fever for England and Wales and Eire.

EPIDEMIOLOGICAL NOTES

Neonatal Gastro-enteritis at Scunthorpe

There have been five deaths recently among babies in the children's ward at the Scunthorpe War Memorial Hospital. The details are as follows:

1. A male aged 6 months had previously been under treatment for a cleft lip. He was admitted on Oct. 25 as a possible case of tuberculous meningitis. He died two days later after vomiting several times and a moderate degree of diarrhoea. Post-mortem examination showed evidence of enteritis.

2. A girl aged 4 months had been under investigation from Oct. 26 to 28 and had been readmitted on Oct. 30 with a strangulated hernia, which was operated on. She started with diarrhoea and vomiting on Oct. 31 and died on Nov. 14.

3. A male aged 8 weeks was admitted on Oct. 8 with pyloric stenosis. He developed diarrhoea and vomiting on Nov. 5 and died on Nov. 10.

4. A male aged 6 weeks was admitted on Nov. 2 with pyloric stenosis. Diarrhoea and vomiting appeared on Nov. 8 and the boy died on Nov. 12.

5. A male aged 14 months had been admitted on June 18 with coeliac disease. Diarrhoea and vomiting were noted on Nov. 8 and he died on Nov. 17.

Other babies were infected, and in two of them diarrhoea and vomiting appeared on Oct. 31. The others developed the same symptoms on Nov. 1, 3, 4, and 17. One was a convalescent poliomyelitis case, two were admitted with meningitis, one had bronchopneumonia, and two were orthopaedic cases.

No organisms were isolated from the faeces of any of these cases or from samples taken from the remaining 17 children in the hospital ward. None of these babies were breast fed. All were bottle fed on National dried milk, and all bottles and teats were pooled for boiling after each feed.

Poliomyelitis

The fall in the notifications of poliomyelitis 186 (198) was again a small one, and there was a small rise in those of polioencephalitis 15 (12) in the week ending Nov. 15. Figures for the previous week are shown in parentheses. Notifications of poliomyelitis in London A.C. were 12 (16), and most of the southern counties showed small reductions except Kent 15 (4) and East Sussex 9 (3). The northern counties also showed reductions for the most part, but there was a tendency to small increases in East Anglia and the West.

Discussion of Table

In *England and Wales* an increase was recorded in the notifications of scarlet fever 201, measles 127, diphtheria 41, and whooping-cough 35. Decreases were reported in the incidence of acute poliomyelitis 23 and dysentery 21.

A small rise in the incidence of scarlet fever was recorded in most areas of the country; the largest rise was that of Yorkshire West Riding 31. The largest increases in the notifications of measles were those of Lancashire 54, Monmouthshire 45, Glamorganshire 35, and Derbyshire 33; the largest decrease was in Yorkshire West Riding 62.

The only notable variation in the returns for diphtheria was an increase of 19 in Lancashire; the notifications in Liverpool C.B. rose from 21 to 32.

A further 53 cases of dysentery were notified from the outbreak in Berkshire, Wallingford R.D.; 368 cases have been notified in this area during the past three weeks (see Nov. 22, p. 850).

The largest returns of poliomyelitis were Lancashire 34, Middlesex 19, and London 16.

Two outbreaks of gastro-enteritis in maternity hospitals have been reported. The outbreak in Cardiff caused the deaths of 8 babies aged under one month, and the outbreak in Lincolnshire resulted in 5 deaths.

In *Scotland* there were increases in the notifications of acute primary pneumonia 90, measles 60, and scarlet fever 10. The only falls in incidence were diphtheria 8, and acute poliomyelitis 7. The increased incidence was mainly confined to the city of Glasgow, where there were rises in the notifications of acute primary pneumonia 79, and measles 54.

In *Eire* a rise was reported in the incidence of diarrhoea and enteritis 15 and diphtheria 12, while decreases were recorded for scarlet fever 16 and whooping-cough 15. Cases of diphtheria were reported from 14 administrative areas, compared with 9 areas last week.

In *Northern Ireland* an increase of 15 in the notifications of scarlet fever resulted in the largest return for this disease in recent months. Of the 63 cases of scarlet fever 32 were notified in Belfast C.B.

Week Ending November 15

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 1,947, whooping-cough 1,217, diphtheria 195, measles 2,355, acute pneumonia 582, cerebrospinal fever 40, acute poliomyelitis 186, acute polioencephalitis 15, dysentery 95, paratyphoid 8, and typhoid 11.

Medical News

Hearing-aids and Audiometers

The Committee on Electro-acoustics, which was appointed by the Medical Research Council in February, 1944, has now issued its Report on Hearing Aids and Audiometers (Med. Res. Cncl. Spec. Rep. Ser. No. 261). This committee is one of three that were appointed by the Medical Research Council in 1944 in response to a request by the Ministry of Health for advice on how to deal with the problem of deafness in the nation; the other two committees were those on Medical and Surgical Problems of Deafness, and on the Education of the Deaf. The members of the Committee on Electro-acoustics are as follows: Mr. W. G. Radley, Ph.D. (Chairman); Sir W. Lawrence Bragg, F.R.S.; Mr. R. S. Dadson, M.A.; Dr. C. S. Halipike; Col. D. McMillan; Mr. L. C. Pocock, M.Sc.; and Mr. T. S. Littler, M.Sc. (Secretary). The committee undertook two principal tasks: (1) to determine the practicability of designing a single type of electrically operated hearing-aid which would be small, light, reasonably cheap, and be suitable for most persons with deafness of types that can be benefited by mechanical appliances; (2) to determine satisfactory performance specifications for pure-tone audiometers for use in the early diagnosis and accurate assessment of different types of deafness. Details of the committee's investigations are contained in this Report. The Ministry of Health has already arranged for the large-scale manufacture of a hearing-aid on the lines recommended in this Report, and it is hoped that it will be possible to start distributing the aids by the time the National Health Service Act, 1946, comes into operation. The Ministry of Health states that in due course a public announcement will be made about the clinical testing of deaf people and supplying the Government hearing-aid. It is proposed that they should be issued to deaf patients on the recommendation of ear specialists at a number of hospital clinics throughout the country, and plans are being made for providing the clinics with the technical services required for the efficient dispensing and maintenance of the aids. The Ministry hope also to provide at these clinics a standard type of pure-tone audiometer which will satisfy the committee's requirements.

The Gordon Hospital

The Duchess of Kent will formally reopen the Gordon Hospital (Vauxhall Bridge Road, London, S.W.) on Tuesday, Dec. 2, at 3 p.m. During the war the hospital was used as a Services club.

New Member of Spens Committees

The Minister of Health and Secretary of State for Scotland have appointed Sir Horace P. Hamilton to be a member of the inter-departmental committees under the chairmanship of Sir Will Spens which are considering (*a*) what ought to be the range of total professional income of a registered dental practitioner in any publicly organized service of general dental practice, and (*b*) what ought to be the range of remuneration in the different branches of consultant and specialist practice in any publicly organized hospital and specialist service. He succeeds Sir Thomas Gardiner, who has been appointed Chairman of the New Town Development Corporation for Stevenage. Sir Horace Hamilton was the Permanent Under-Secretary of State for Scotland from 1937 to 1946.

Chelsea Clinical Society

The second dinner meeting of the new session was held on Nov. 11 with the President, Dr. Neil Maclay, in the chair. Mr. Geoffrey Parker described his experiences as surgeon to the Maquis.

Anaesthetists in the South-west

A Society of Anaesthetists of the South-west Region has been formed. The inaugural meeting was held at Bristol on Nov. 14 and 15, when Dr. Bradbeer, of Bristol, was elected President for the coming year. Prof. R. R. Macintosh lectured on "Anaesthesia used for Research Purposes."

Anaesthetist Visits Italy

Dr. G. Organe, consultant anaesthetist to Westminster Hospital, has gone for a three weeks' lecture tour in Italy to introduce the latest methods of anaesthesia to the Italian medical profession. Dr. Organe will lecture in Italian and will give demonstrations in Rome, Naples, Bologna, and Milan.

British Council Scholarships

The British Council has awarded 256 scholarships to graduates from 62 countries, including the Dominions and Colonies, and extended the scholarships of 106 other scholars. Forty-four of these scholarships are in medical subjects, and the scholars will train at many of the leading hospitals in the country, including the Royal Derbyshire Infirmary; the Royal Infirmary, Glasgow; the Plastic Surgery Unit, Oxford; the Children's Hospital, Birmingham; the Royal Cancer Hospital, London; the Manchester Royal Infirmary; and the Children's Hospital, Great Ormond Street, London.

General Smuts

General Smuts, the Prime Minister of South Africa, was admitted to Honorary Fellowship of the Royal College of Obstetricians and Gynaecologists on Nov. 22.

Sir Godfrey Huggins

Sir Godfrey Martin Huggins, F.R.C.S., who has been Premier of Southern Rhodesia since 1934, has been appointed to the Privy Council.

Atomic Energy Commission

The United States Atomic Energy Commission has appointed Dr. Shields Warren, Director of the Massachusetts State Tumor Diagnosis Unit, interim director of its newly established Division of Biology and Medicine. The Division will correlate research in the A.E.C. and private laboratories.

City of Plymouth Mental Hospital

The City of Plymouth Mental Hospital, previously known to Plymothians as Blackadon, has been renamed Moorhaven Hospital. The early treatment unit will continue to be known as Moorfields Hospital. The postal address in each case is Ivybridge, S. Devon.

New Birth Certificates

A new form of birth certificate will be brought into use on Dec. 15. It will not show particulars of parentage or adoption, but only the name and surname, sex, date of birth, and place of birth.

Penicillin Factory

The penicillin factory at Speke, Liverpool, which has been operated for the Ministry of Supply by the Distillers Company Ltd. since Dec., 1945, will become a commercial undertaking on Dec. 1 of this year. A new company has been formed for the purpose; it will be called the Distillers Company (Biochemicals) Ltd.

Wills

Dr. Robert George Clements, of Southport, left £18,047. Dr. Lancelot Raoul Lempriere, of Ware, Herts, left £32,456. Mr. William Ernest Miles, formerly consulting surgeon to the Royal Cancer Hospital, left £14,856. Dr. Walter Ramsden, Johnston Professor of Biochemistry at Liverpool University, 1914–31, and formerly lecturer in chemical physiology at Oxford, left £23,169.

COMING EVENTS

Ethics and Science

A conference will take place on Dec. 4, beginning at 10.30 a.m., in the Livingstone Hall, Tothill Street, Westminster, S.W.1. Its main theme will be "Society and the Individual," which will be considered under two aspects—namely, "The Value Society Sets Upon the Individual," and "The Values the Individual Sets Before Himself." There will be discussions after both the morning and afternoon sessions and at an open meeting in the evening. The aim of the conference is to effect in some measure a synthesis between the spiritual and the scientific interpretations of life. The chair will be taken by Prof. Winifred Cullis and Dr. E. B. Strauss. Further information and tickets (members of Council 2s. 6d., others 3s. 6d.) may be obtained from the British Social Hygiene Council, Tavistock House North, Tavistock Square, London, W.C.1 (Tel. Euston 4732).

Faculty of Homoeopathy

A meeting of the Faculty of Homoeopathy will be held at the London Homoeopathic Hospital, Great Ormond Street, W.C., on Thursday, Dec. 4, at 5 p.m., when Mr. Harold Dodd will give an address on "Five Ailments Aggravated by Present Austerity Conditions."

Metallic Contaminants in Foodstuffs

A joint meeting of the Food Group of the Society of Chemical Industry and the Society of Public Analysts and Other Analytical Chemists will be held at the Chemical Society's Rooms (Burlington House, Piccadiily, London, W.) on Wednesday, Dec. 3, at 7 p.m., when papers on "The Occurrence, Physiological Importance and Estimation of Metallic Contaminants in Foodstuffs" will be presented by Messrs. G. E. Forstner, G. W. Monier-Williams, W. F. J. Cuthbertson, and N. L. Allport and D. E. Garratt. A discussion will follow.

Medical Society of the L.C.C. Service

A clinical meeting of the Medical Society of the L.C.C. Service will be held at Lewisham Hospital on Thursday, Dec. 4, at 3 p.m.

Heberden Society

A clinical meeting of the Heberden Society will be held at West London Hospital, Hammersmith, W., on Friday, Dec. 5, at 5 p.m.

Housing and Health

Dr. J. H. F. Brotherston will lecture on "Housing and Health" on Dec. 16 at the Housing Centre, 13, Suffolk Street, Haymarket, London, S.W.1 (Tel. Whitehall 2881).

SOCIETIES AND LECTURES

ROYAL SOCIETY OF MEDICINE

Section of Orthopaedics.—Tuesday, Dec. 2, 5.30 p.m. (Cases at 4.30 p.m.) Cases will be shown.

Section of History of Medicine.—Wednesday, Dec. 3, 2.30 p.m. Papers by Dr. E. Ashworth Underwood: Charles Creighton (1847–1927): Scholar, Historian, and Epidemiologist; Prof. Major Greenwood: Certain Aspects of the Epidemiology of Creighton.

Section of Epidemiology and State Medicine.—Members of this Section are specially invited to attend.

Section of Surgery.—Wednesday, Dec. 3, 8 p.m. Discussion: The Treatment of Carcinoma of the Breast. Openers: Sir Gordon Gordon-Taylor, Mr. R. McWhirter, and Sir Stanford Cade.

Section of Radiology.—Members of this Section are specially invited to attend.

Section of Neurology.—Thursday, Dec. 4, 8 p.m. Discussion: Electro-encephalogram in Organic Cerebral Disease. Opener: Dr. W. Grey Walter. Followed by: Drs. Denis Hill and Denis Williams.

Section of Otology.—Friday, Dec. 5, 10.30 a.m. Papers by Mr. I. Simson Hall and Dr. A. Young: Penicillin Treatment in Acute Suppurative Otitis Media with Special Reference to Long-term Hearing.

Section of Laryngology.—Friday, Dec. 5, 2.30 p.m. Films: Mr. G. H. Bateman: Organic Disorders of the Larynx; Mr. V. E. Negus: Bell Telephone Film of Larynx.

Section of Anaesthetics.—Friday, Dec. 5, 5.30 p.m. Paper by Dr. J. K. Hasler: Posture in Anaesthesia.

CHADWICK TRUST.—At St. Mary's Hospital Medical School, Norfolk Place, Praed Street, W., Thursday, December 4, 4.30 p.m. Dr. G. B. Mitchell-Heggs: Some Changes in Dermatology since the time of Sir Malcolm Morris.

LONDON UNIVERSITY.—At Goldsmiths' College, Lewisham Way, New Cross, S.E.—Monday, Dec. 1, 7.30 p.m. Speech-demonstration: Stammerer to Orator. Short addresses by members of Speech Disability Classes.

ROYAL MEDICAL SOCIETY, 7, Melbourne Place, Edinburgh.—Friday, Dec. 5, 8 p.m. Dissertation by Mr. M. D. W. Low: Uraemia and Some Methods of Treatment.

POSTGRADUATE DIARY

EDINBURGH UNIVERSITY.—Monday, May 3, 1948, 9 a.m., 12th General Fortnight Refresher Course begins. Intended primarily for demobilized medical officers (Class II) and for insurance practitioners. Fee for graduates not claiming expenses from Government sources, 10 gns.

INSTITUTE OF DERMATOLOGY, 5, Lisle Street, Leicester Square, London, W.C.—Tuesday, Dec. 2, 5 p.m. Dr R M B MacKenna: The Erythema Group of Eruptions. Thursday, Dec. 4, 5 p.m. Dr. R. T. Brain: Filtrable Viruses.

LONDON CHEST HOSPITAL, Victoria Park, E.—Friday, Dec. 5, 5 p.m. Dr. S. Roodhouse Gloyne: Pneumoconiosis.

A clinico-pathological demonstration will be held in the Meyerstein Lecture Theatre of the Westminster Hospital School of Medicine, Horseferry Road, London, S.W.1, on Monday, Dec. 1, at 5 p.m. The condition to be demonstrated is osteogenic sarcoma.

APPOINTMENTS

Dr. R. F. MacKenzie has been appointed medical officer of the North-eastern and Scottish Areas of the L.N.E.R. in succession to Dr. J. D. Gunn, who has retired.

Dr. MacKenzie qualified at Glasgow University in 1937; in 1944 he was appointed medical officer of the Silicosis Board at Cardiff, and remained there until May, 1946.

Mr. R. J. Fenney, B.A., previously Assistant Secretary, has been appointed Secretary and Chief Executive Officer of the Central Midwives Board in succession to Mr. A. J. Bennett, M.A., who has been appointed Secretary to the North-west Metropolitan Regional Hospital Board.

Dr. Luiz Araujo has been appointed President of the Medico-Surgical Society of Pará, Brazil.

Lieut.-Col. C. Newton-Davis, *M.C.*, J.P., I.M.S. (ret.), has been appointed chairman of the Health Committee of the Hampshire County Council.

Major G. M. Thomson, M.D., M.R.C.P.Ed., D.P.H., has been appointed Adviser on Venereal Diseases Control to the West Indian Governments.

Major-Gen. E. A. Sutton, C.B., C.B.E., *M.C.*, K.H.S., succeeds Lieut.-Col. A. D. Stewart as Superintendent of the Royal Infirmary, Edinburgh.

Previous appointments that Major-Gen. Sutton has held include that of D.D.M.S. Western Desert Force under Lord Wavell, D.M.S. East Africa Command, and Chief (British) Medical Adviser, S.H.A.E.F.

BROWNE, O'DONEL, T. D., M.B., B.Ch., F.R.C.P.I., F.R.C.O.G., Professor of Midwifery, Trinity College, Dublin, has been appointed Master of the Rotunda Hospital, Dublin, in succession to Dr. Ninian McI. Falkiner, F.R.C.P.I., F.R.C.O.G., who completed his seven years' term as Master on Nov. 7.

MCNAB, G. R., M.D., F.R.C.P.Ed., Assistant Physician, Berks and Bucks Joint Sanatorium, Peppard Common, Henley-on-Thames, Oxon.

SUTTON, EVELYN ALEXANDER, C.B., C.B.E., *M.C.*, M.R.C.S., L.R.C.P., Major-General, late R.A.M.C., Honorary Surgeon to the King, has been appointed Superintendent of the Edinburgh Royal Infirmary.

THOMPSON, W., F.R.C.S., Chief Assistant to a Surgical Unit, Manchester Royal Infirmary.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Hartley.—On Nov. 6, 1947, at Radmoor Nursing Home, Loughborough, to Wendy (Joyce Bell) and Peter L. M. Hartley, M.B., B.Chir., a son—Peter Rupert.

Lister.—On Nov. 13, 1947, at Parkgrove, Glasgow, to Nancy B. Thomson, M.A., wife of Dr. James A. Lister, 549, Alexandra Parade, Glasgow, a son—Alan Andrew.

MacAuliffe.—On Oct. 30, 1947, at Purey Cust Nursing Home, York, to Judy (*née* Baldry), wife of Dr. Richard MacAuliffe, a daughter—Jane Mary.

Podolier.—On Nov. 8, 1947, at South London Hospital for Women, to Diana (*née* Myott), M.B., B.S., wife of Paul Podolier, a son.

MARRIAGE

Whowell—Murray.—On Nov. 15, 1947, in London, W. Brian Whowell, M.B., B.S., to Joy Murray, M.S.R.

DEATHS

Atkinson-Fleming.—On Nov. 14, 1947, in London, Frederick Charles Atkinson-Fleming, M.C., M.B., B.Ch., Major R.A.M.C., retired.

Bentall.—On Nov. 16, 1947, William Charles Bentall, O.B.E., F.R.C.S.Ed., Knight of the Order of St. John of Jerusalem.

Bouman.—On Nov. 8, 1947, at Amsterdam, Prof. K. H. Bouman, M.D., aged 73.

Cosgrove.—On Nov. 17, 1947, at Sydney, Australia, Charles Cosgrove, M.C., L.R.C.P.&S.Ed.

Eaves.—On Nov. 21, 1947, Elizabeth Cowper Eaves, M.D., D.P.M., at 2, The Mount, Sheffield.

Farquharson.—On Nov. 16, 1947, at All Saints' Hospital, Southwark, S.E., George Sinclair Farquharson, M.B.

Herring.—On Nov. 22, 1947, at 50, Harley Street, London, W., Herbert Thomas Herring, O.B.E., M.B., B.S.

Hunt.—On Nov. 22, 1947, in London, David Mackenzie Hunt, L.M.S.S.A.

Knight.—On Nov. 18, 1947, at Falkland House, Painswick, Charles Voughton Knight, M.D., aged 75.

Lipscomb.—On Nov. 19, 1947, at Keswick, Thomas Walter Lipscomb, M.B., M.Ch., F.R.A.C.S., of Sydney, Australia.

Macintosh.—On Nov. 21, 1947, at Edinburgh, Ebenezer Crombie Macintosh, L.R.C.P.&S.Ed.

McRae.—On Nov. 20, 1947, at 63, Oxgangs Road, Edinburgh, Douglas Arthur Clouston McRae, M.B., Ch.B., aged 32.

Mathews.—On Nov. 6, 1947, at Sandiway Lodge, Prestatyn, Henry John Mathews, M.D., aged 82.

Montgomery.—On Nov. 19, 1947, at 3, High Street, Wolstanton, Staffs, Anna Pauline Montgomery, M.D.

O'Donnell.—Sir Thomas Joseph O'Donnell, K.C.I.E., C.B., D.S.O., L.R.C.P.I., Major-General A.M.S., retired.

Rosewarne.—On Nov. 4, 1947, David Davey Rosewarne, M.R.C.S.

Sharpes.—On Nov. 17, 1947, Harry Arthur Sharpes, M.R.C.S.

Wood.—On Nov. 23, 1947, at City Hospital, Edinburgh, Robert Carmichael Wood, M.B., Ch.B.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

B.C.G. Vaccination

Q.—*Is it advisable to vaccinate a healthy child of three months with B.C.G.? He lives with his father, who has open pulmonary tuberculosis. It is an only child and the mother is healthy. At what age is B.C.G. used and how many injections are necessary? Are there any dangers?*

A.—B.C.G. is not yet obtainable in this country, but the Ministry of Health is understood to be taking steps to make it available. Its use will then presumably be entrusted to tuberculosis officers and others with special experience, who will undertake to administer it according to some prearranged plan and for certain definite indications. Opinion on the value of B.C.G. vaccination is not unanimous, and it seems desirable that its use in this country should be controlled until more evidence has been obtained. The infant with a sputum-positive parent has always been considered a candidate for this treatment; vaccination has usually been carried out shortly after birth and the child removed from the household for several months afterwards in order that it may have time to develop immunity before exposure to infection. (See also the opening article in this week's issue and our leading article at p. 873.)

Effects and Legality of Sterilization

Q.—(*a*) *Does vasectomy have any effect, other than producing sterility, on male functions generally—libido and coitus in particular?* (*b*) *Is sterilization of males or females illegal? If so, does this apply also to sterilization for therapeutic reasons?*

A.—(*a*) It is rare for a sterilizing operation such as vasectomy to have any effect on libido or coitus. The writer can recall only one patient who complained of a diminution in the volume of the ejaculate after he had undergone division of the vasa, but even he did not consider that this brought about a lowering of satisfaction. Theoretically (on the basis of Ancel's and Bouin's experiments on animals) ligation should bring about an increase in sexual desire, but in practice in human beings this has not been found to be the case.

(*a*) There is no statute which prohibits sterilization. Such a procedure may be an example of the common-law crime of "mayhem," or maiming, but no prosecution has been instituted for this offence in recent times, and it is generally regarded now as obsolete. Sterilization, like any other surgical procedure, may amount to an assault unless carried out with the patient's consent; or, if the patient is under legal disability (for example, is a minor or of unsound mind), the consent must be obtained from the person who has authority to give it on his behalf. No action for assault will lie if such consent has been obtained and if there are reasonable grounds for the treatment, such as to save life or to cure disease. For example, it would be quite reasonable to sterilize a woman suffering from rheumatic carditis to such a degree as to make pregnancy dangerous to life. It is quite proper to ligate the spermatic cords in a male during the operation of prostatectomy in order to reduce the risk of epididymitis. Special precautions are advisable when the patient is married, and it is best to obtain the consent not only of the patient but also of the partner, after a full explanation of the circumstances of the case. One of the medical protection societies has suggested standard forms of consent worded as follows:

1. For a woman: "I, ..., of ...., hereby consent to undergo the operation of ....., the effect and nature of which have been explained to me."

2. For a husband: "I, ... of ...., the husband of the above-named....., hereby also consent to such operation."

3. For either sex: "I....., of ....., hereby consent to undergo the operation of.....and/or such further or alternative operative measures as may be found to be necessary during the course of such operation."

(The latter part of the third formula could be deleted if not required.)

In view of the serious and irrevocable consequences which follow a sterilization operation, it is often advisable, as in the case of a contemplated operation to terminate pregnancy, to obtain the opinion of an independent medical colleague before carrying out the operation. Sterilization is sometimes advocated on eugenic grounds—for instance, to prevent the transmission of hereditary disease; it is probably illegal to perform such an operation, but the point has not so far been tested in the courts.

Prophylaxis of Dental Caries

Q.—*Is there any effective preventive treatment for recurrent exacerbations of dental caries in young adolescents? In view of the amount of calcium in the present flour, and of calciferol in butter and margarine, should additional doses of these essential dentine-forming substances be given? Is massive dosage with vitamin D to be recommended? Among other aetiological factors a deficiency of fluorine has been mentioned. Another possible factor in causation of dental caries in adolescents may be traceable to overdosage with vitamin D during the early 1930's, when the enthusiasm of manufacturers tended to outrun discretion, with the result that children were given daily doses greatly in excess of 2,000 i.u.*

A.—Our knowledge of the precise aetiology of dental caries is unfortunately still so incomplete that no single prophylactic measure can be advised that will certainly lessen the incidence in adolescents. Recently doubt has been cast on the validity of Miller's (carbohydrate-fermentation, lactic acid) theory, and more attention has been paid to the possible role of the organic portion of the enamel as the potential portal of entry. The evidence at present is that a civilized diet certainly appears to be one of the major factors in aetiology, though other factors, such as heredity, enter into it. Additional calcium will do no harm, but the evidence that calcium and vitamin D have any effect upon the disease, once the teeth have calcified, is not very striking. Overdosage with vitamin D is unlikely to cause any increase in the disease, so far as is known. Ingested fluorides do appear to have a marked inhibitory effect, particularly if absorbed while the teeth are calcifying. Large-scale experiments are at present being undertaken in the United States to assess the value of fluorides artificially added to the water supply.

Complicated Labour

Q.—(*a*) *What is the cause of extension of the legs in a breech presentation?* (*b*) *What is the treatment for a young primipara, fifteen hours in labour, head on pelvic floor, cervix two fingers dilated, when foetal distress is present?* (*c*) *What is the treatment of a primipara with a marked degree of pelvic contraction and heavy vaginal infection at term?*

A.—(*a*) For reasons unknown, probably as the result of chance, the foetal legs sometimes become extended early in pregnancy, and it is the extension which causes the breech presentation, and not vice versa. This effect is mostly seen when the uterus has good tone, as in primigravidae. In most multigravidae, and in a few primigravidae, the uterus is sufficiently relaxed to allow the foetus to alter the attitude of its legs or even to allow spontaneous version with the legs extended. There is therefore much to be said for regarding extension of the foetal legs as "normal" and desirable when the breech presents in a primigravida. Indeed, in primigravidae if the foetal legs are not extended a diligent search should be made for another cause for the breech presentation, such as contracted pelvis or placenta praevia.

(*b*) If the baby's life is to be saved without undue risk to the mother the alternatives are: (1) lower-segment caesarean section followed by chemotherapy; (2) single or multiple incisions of the cervix followed by forceps delivery. The latter procedure is safe only when the cervix, although incompletely dilated, is extremely thin, and even then should be carried out only by an expert working in a fully equipped theatre. It

should always be borne in mind, however, that the occurrence of foetal distress in circumstances such as those described—that is, when the stress of labour has been so little as to make the onset of foetal distress unexpected—should raise doubts as to whether the foetus is normally developed. Before any treatment is decided on it is desirable in such cases to examine the foetus by *x* rays for evidence of spina bifida, etc. Other possibilities, such as looping of the cord round the neck or trunk, should also be kept in mind.

(*c*) It is not stated what sort of vaginal infection is in question. In the case of infection with trichomonas or fungus there need be little anxiety, because such organisms rarely, if ever, infect the upper genital tract. Apart from these, the only common infection in the lower genital tract is gonorrhoea. If the patient is not in labour, then treatment for the disproportion should be delayed a few days until treatment appropriate to whatever organism is present has been instituted and the infection is under control. If delay is impossible, then caesarean section is not contraindicated, provided the lower-segment technique is employed and chemotherapy is started immediately. The vagina might be disinfected as thoroughly as possible by washing out and painting with "Bonney's blue" immediately before operation, but the value of previous vaginal preparation has not been convincingly demonstrated and is not essential.

Atopic Dermatitis

Q.—*For five years a woman aged 43, otherwise healthy, has had seborrhoea sicca and an allergic dermatitis of her scalp, neck, arms, and shoulders. There is no demonstrable area of focal sepsis. She cannot tolerate any kind of soap or spirit and has been proved to be allergic to eggs, horses, and dogs. Most treatment seems to cause a flare-up, though a local calamine ointment does help to relieve the intense burning and itching. What treatment do you suggest?*

A.—The diagnosis would appear to be between atopic dermatitis, contact dermatitis, and seborrhoeic dermatitis. That she has been proved allergic to eggs, horses, and dogs and has severe pruritus would suggest that it is an atopic dermatitis. Investigation and treatment would be by trial elimination of the common foods from the diet for six weeks, possibly a little longer. Scratch and intracutaneous tests are usually positive in this condition, but their value in tracing the offending allergen is doubtful. The most likely foods are egg, wheat, milk, and potato, in this order. Each food must be eliminated completely during the trial period. The age is in favour of a contact dermatitis, and patch tests would help in this condition. Location of the primary site might give a clue to the allergen. If the scalp were first involved it would suggest hair dyes, hair tonics, cosmetics, etc.; if the neck, an article of clothing, the dye in such article, etc. Symptomatically, the use of one of the new antihistamine drugs is well worth a trial. "Benadryl" in doses of 50 to 100 mg. might help, especially at night, owing to its tendency to cause drowsiness. "Anthisan" (pyranisamine maleate) is used in doses of 400 to 1,000 mg. a day and is less likely to cause drowsiness.

Constipation in an Infant

Q.—*A male child aged 4 months, although in excellent condition, gaining weight, and contented, has settled down to one motion a week. The stool is normal in colour and consistency. Until the age of 6 weeks his bowels acted normally, then for about a month he passed slightly frothy stools, gradually changing to his present constipated routine. As the child is so well, what should I do about its condition?*

A.—Although frequency of stools varies considerably in normal infants, the present interval is so long that it does suggest the possibility of Hirschsprung's disease. As the stools are normal in consistency and colour, it would be advisable in the first instance to try the use of a soap stick or vaselined glass rod inserted into the anus daily at the same hour, to see if a more frequent habit could be instituted. It would also be advisable to have a barium follow-through to elicit any radiological evidence of a congenital abnormality. It is inadvisable to use liquid paraffin or purgatives routinely at this age, and unless a congenital abnormality can be demonstrated it is unlikely that any surgical treatment will be required in the absence of distension or general symptoms.

NOTES AND COMMENTS

Ringworm of Scalp.—Dr. J. T. DUNCAN (Department of Medical Mycology, London School of Hygiene and Tropical Medicine) writes: Col. W. H. Crichton (Oct. 18, p. 640) described his successful treatment of a number of cases of head ringworm of children in North Devon by means of a saturated solution of potassium permanganate. The species of ringworm fungus concerned was not mentioned, but readers may assume that it was the common parasite *Microsporum audouini*. The experience of nearly half a century leaves no doubt that infection of the hair by *M. audouini* is extremely difficult to cure by any local treatment except epilation by the use of *x* rays. On the other hand infection of the hair of children by the alien and less well adapted parasite *Microsporum canis* is known, with a few exceptions, to yield readily to topical treatments. In South Devon the predominating dermatophyte found in tinea capitis of children is *M. canis*, and this is true also of parts of North Devon. It cannot too strongly be urged that the identity of the infecting dermatophyte should be established before treatment of tinea capitis is undertaken, and it is especially important that the name of the causative fungus should be stated in connexion with reports on the treatment of head ringworm. (Since I wrote the accompanying note I have consulted our records and found that between October, 1946, and May, 1947, we identified 37 cases of infection by *Microsporum canis* from specimens of hair of children in the Barnstaple area of North Devon sent to us by a Dr. W. Crichton.)

Food Allergy.—Dr. JOHN FREEMAN, of the Wright-Fleming Institute of Microbiology, writes: A well-known London physician has called my attention to the question and answer on food allergy (Oct. 11, p. 598). He says your answer is not good, and I quite agree with him. The question as stated gives the presumption that the child is egg-sensitive. Though that is quite unlikely to be the whole of the story, it is important to know whether or not this presumption is correct. Trial dieting is very fallacious and has many disadvantages. The way to test is by a skin test with egg protein; this is quite reliable for finding a positive or negative to that particular sensitivity. This test is, however, only one item in the necessary investigation. If the child *is* sensitive to egg, and this is playing a big part in producing symptoms (and that is a big assumption), the child can be desensitized with egg protein, though this is not a job for the inexpert. It is probably preferable with a child of that age that egg should simply be avoided in the dietary. Lastly, doping a patient with "benadryl" has its disadvantages, though it may be a useful temporary expedient in some cases. I agree that immunization with diphtheria toxoid and pertussis vaccine is very unlikely to have any bad effect on this child.

"Pen Friends" for the Old.—Miss M. A. PRATT ("Hillview," Bryants Bottom, Great Missenden, Bucks) writes: In spite of schemes for the care of our aged and chronic sick folk, it seems inevitable that for years to come most of them will spend their days in institutions, where too often they are completely cut off from the outside world. . . . For some years the Pen Friends' Guild has provided correspondents for inmates of L.C.C. institutions who never get a letter. The service has been much appreciated and is being extended to other counties. Offers of help, either as correspondents or as county organizers, would be very welcome.

Pink Disease.—Dr. G. M. B. HALES (Sydney, New South Wales) writes: In the *Journal* of June 21 (p. 911) a correspondent asks for advice about a case of pink disease. During the past ten years, both at the Renwick Hospital for Infants, Sydney, and privately, I have treated these patients with intramuscular injections of liver extract and vitamin B_{12} 15 mg., twice weekly. In the majority of cases, and particularly if seen early, there is marked improvement and loss of the characteristic irritability after the third or fourth injection. It is rarely that more than twelve injections are required and recovery is generally complete in about eight weeks.

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111. TELEGRAMS: *Aitiology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

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